

# DRAGON USER

International edition

*The independent Dragon magazine*

75p US\$3.25 April 1994



*Widening your  
horizons  
with Prestel*

*Building a  
lightpen*

*Murmuring in  
machine code*

*Latest games  
reviewed*

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**DDC:** Eagle £7.95 (Original Arcade Action). Tarbo £9.95 (RISC Compiler).

# DRAGON USER



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## How to submit articles

The quality of the material we can publish in  
Dragon User is most vital. It is very great-  
ly affected by the quality of the in-  
formation that you can bring to your Dragon.  
The Dragon User sample was launched on  
to the market with a powerful mission of  
being the best-selling news dissemination.

Every one of us who uses a Dragon will be  
able to discover the benefits and going almost  
every day. To help other Dragon users have  
up with the speed of the development each  
of us must ensure that we make the  
necessary link — that means writing a clear  
and passing a clear letter.

Articles which are submitted to Dragon  
User (or publication) must not be more than  
5000 words long. All submissions should be  
typed. Please leave wide margins and a  
double space between each line. Programs  
should be written in a clear, simple, and  
printed on plain white paper and be com-  
piled by a tape of the program.

We cannot guarantee to return every  
submitted article or program to please keep  
a copy. If you wish to have your program  
returned you must indicate it clearly.  
All second editions

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## Editorial

"THE ENTRANCE FROM the wings of GED was not entirely unexpected," was our  
comment last October when Brian Moore, formerly deputy managing director of a GED  
subsidiary, took over the running of Dragon Data. So it was not a surprise when  
the company's grand move to the new site in April 1984 was not a surprise when  
the company's grand move to the new site in April 1984 was not a surprise when

It was announced that sales and marketing of all Dragon Data products had been  
taken over by another GED subsidiary — GED Marketing (this is one way to tell you're  
dealing with a joint company when you find it a bit tedious everywhere). GED now  
has a finger in a lot of computer game ranging from such things as specialized chip  
manufacture to hardware. It is not clear if the game really is what GED's grand strategy is,  
but it certainly has enough cash to support any move it wants to make. And it is also  
prepared to play a waiting game. Early last summer GED was involved in talks with  
and for British Telecom subsidiaries. Then these talks came to nothing, and only now  
has the company's interest in the telecom market been publicly revived.

However, GED has moved one step closer to moving in Dragon Data. To move Moore,  
formerly a shareholder in Dragon Data and the founder of Dragon computers, went into  
restructuring of the end of last October — nearly a year after selling Dragon Data off to a  
subsidiary of Inmos. The move has Moore's shares with us for good, with the  
other shareholders having their shares. At the same time as news of the GED marketing  
deal broke, it was announced that existing shareholders had taken over Moore's  
holdings. As one thing with the Dragon's past was fairly quiet, as the GED share  
continued to move. The main shareholders in Dragon Data is in fact Project, the high  
technology investment division of Prudential Assurance, and a shareholder in GED.

What this restructuring means for Dragon users is hard to say. GED's marketing  
influence seems more likely to benefit Dragon Data's move into the business market —  
how much cost the services team can bring to bear on the home computer market  
remains to be seen (although this is now irrelevant, the relationship between the two  
companies will be). Obviously Dragon Data will be concentrating on developing products  
GED is keen to market — so in this way GED will be playing some role in deciding  
Dragon Data's direction of course. From our side, we have to be involved with a game like  
GED. Its early move suggests that it will be on the one hand, entering out on the other  
side. The first users, a little disappointed for the home computer market but the  
second side a few advantages for users — for example, Microcal's interest in providing a  
Dragon service has been encouraged by GED's arrival. And GED has a reputation for  
solving many of the problems of other sites by allowing its subsidiaries a great deal of  
independence.





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# Oasis Software present...

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## GEC selling Dragons

NEW MICROS and peripherals are on the way from Gorgon Data following the news that GEC/McMichael has taken over its UK sales and marketing.

Few details of the products are available but plans include port sourcing on a range of peripherals, with sales appearing this summer.

The new micros, up range to the 64 and running C64s should arrive earlier — with one or possibly two being in the shop by the end of this April.



"We're riding to the rescue"

## Micro drives on the way

MICRO DRIVES with a megabyte of memory are on their way from Premier Microsys alone.

Single "Bee" versions of the 3½ inch floppy drives are already available at just over £250. The dual packaged version with a megabyte of memory formatted will sell for under £250 — including Premier's disk operating system Data.

The desktops themselves cost about £150 for 15 but in Premier's Mike Bedford points out they are "virtually indestructible".

All Premier's disk software will be available — costing between a fiver and ten — covering business utilities, games and education.

# Micronet is set for a spring launch

THE LONG AWAITED tele software service for Dragon users is due to arrive soon from Micronet 800.

BBC and Spectrum users already have access to Micronet which says that it is planning "to offer software to the Dragon 32 64 this spring".

Two models will be available — the 1008 at £99.95

and the more software compatible 2008 at £24.99. Additional communication software will bring the price up to meet the £100 mark. Other models can be good — write to Micronet for details.

Other costs include a tele session charge of £13 a quarter (£8 for Micronet 25 for Proline), a connection charge

of 1p a minute at peak hours and the cost of the telephone call.

In return you get access to a range of free software, micro news, electronic mailboxes, Swapshop and Clubnet — plus the chance to play the interactive game Genie!

Mail Micronet you also have access to the rest of Proline.

## All the fun at the fair

THE maze from the Leisure Electronics Trade show held recently at London's Harrogate Ponds Hotel was good for Dragon users.

The show, first of its kind and a trade only exhibition for the home computer industry. Over 100 exhibitors gathered together to display their best selling and so and coming products and software titles.

Of micronet to Dragon software built are now titles from Salamander, Shards and Sals.

Following on from its January release Salamander has scheduled March as the date to launch The Wings of War. Having penetrated into France and found a chaotic, sometimes deep, a plenty occupied territory you now have to regain your territory and reach the safety of... good old High Wycombe.

And it is a mighty project that you are after. Dan Gorming in France in a Wargame World £20.95 is back. Fresh from the adventures of his original trilogy he is ready to embark on the first of a whole new second trilogy.

Also being released are Red Moon and a 3D maze game at the Planetar station and Single a nice violent machine code escape game originally available for the BBC micro.

From the people at Shards comes a top part sci-fi space adventure, a sound utility and a real life simulation game for adults.

Mystery of the Jinn Sea (£7.95) sets over 1000, of



Space Software's show stealer at £27

memory as you journey from Bristol to London and on to the Caribbean in search of a sunk or treasure ship. With three levels of difficulty and three different scenarios this is billed by Shards as an odd mystery adventure for the whole family.

Shaper (£14.95) is a sound utility program, plus manual which enables you to create a sound from scratch or alter and load on existing sounds by changing one or more of the four variables.

North Sea 3d (£9.75) is an odd tropical game written by an offshore engineer. Acting as offshore installation manager you have to run the oil rig and generate a profit of \$400 million.

Sals Software also has three new releases out now for the Dragon 32 and is planning to release two large programs for the 64.

The programs are all education oriented. Brainspot is a game to test your vocabulary and spelling. Trivia is a logic over the past 10 days the user has to identify a word from its definition or play and spell it correctly. For example, define logic — bring back to life, get

bed pit — a machine you plug definitions word — reason take.

The puzzle is solved when the user succeeds in spelling a series of words correctly and is conquered when three mistakes are made, allowing the individual to mount the challenge.

Following on from this then are Wordpower — a game to help you improve and expand on your use of language and Just a Joke which helps you guess French and French words with their English equivalents are given. All three programs cost £9.95 each.

On the negative side of things Richard Shepherd has no plans at the moment to convert further programs to the Dragon. Transylvania Tower has sold well according to Richard Shepherd but not well enough to encourage further conversions.

However, Quasitive is looking into the possibility of converting some of its successful programs. And Gorming and Gorming the educational software people are considering creating programs for the Dragon 64.



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**J.C.B. (MICROSYSTEMS)**

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**Keywords:** child sexual abuse; disclosure; disclosure strategies; disclosure barriers

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It is a highly unusual, somewhat whimsical, plot centered around a woman and her relationship to her husband's past. The plot revolves around the woman's search for a husband who is not just a good-looking, successful man, but also a good person. The story is set in a small town in the south of France, and the woman is a young, beautiful, and intelligent woman who is looking for a husband who is not just a good-looking, successful man, but also a good person. The story is a classic of the genre, and it is a very good example of the genre.

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There are two advantages to using an integral. One is efficiency because there is no need to calculate derivatives. Another advantage is that the integral can be used to find the area under a curve, which is useful in many applications.



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## Get on board to learn about interfacing

IF YOU want to learn more about microprocessor control and logic design, as are looking for a process control instrument, West Technology may have the answer.

As interface board comes on

a bid for £40 including manual and plugs into the Dragon's cartridge slot.

The interface includes a 6801 peripheral interface adaptor chip, analogue to digital converter, digital to analogue converter, and 10-bit DAC display.

Applications include data acquisition and process control although the board has been designed to be as versatile as possible. Apple, home rates and clocks for development are also included.

Electronically Technology can be contacted at 8 Access Road, West Derby, Liverpool L12 4VH.

## Users' club moves along south coast

THE DRAGON Users' Club in Wexham has outgrown its former home at Gosmen and Computers and moved along the coast to Bournemouth.

The club is now being run by Computerhouse UK, Alan Monaghan, who is moving with the club, explained that the way things grew and the time it takes a new company "to pick up the reagent, but led to some administrative problems.

Computerhouse UK plans to meet any unfilled orders as soon as possible.

Any queries of outstanding orders should be addressed to the complexity at 10 Marshfield Road, Bournemouth, Dorset — or telephone (0202) 254118 from the beginning of April.

Alan also promises that referrals will be offered to users who are not satisfied with the service.

He added that the computer-based magazine Dragonware had had some problems, partly with missing audio cassette sides and Beta programs. But Computerhouse UK will "now on the verge of getting it right."

## Going on the air with the Dragon

DRAGON COMPATIBLE broadcasts are on their way from the Radio 4 Chip Shop programme — and amateur radio fans already have their own network to tune into.

Chip Shop producer Trevor Taylor explained that the Chip Shop (Radio 4) was within days of being ready, how ever listeners should wait until the service is introduced on the air before sending off any money.

Chip Shop started regular broadcasting in the middle of January. Its initial run ended on the 17th March but summer specials are planned and normal service will be resumed on the 16th September.

The Chip Shop programme itself went out on Saturdays at 4 pm. Its Technology Service of software was broadcast on four nights a week at 20 minutes past midnight — just after the shopping service.

The Technology service is broadcast in Bascode 2 A cassette with programs containing files to machines such as the BBC B and the Commodore 64 is already available — at £5.95 including a handbook.

Once the Dragon version is added users will be able to run both Technology broadcasts and any other programs recorded in Bascode 2 on other machines.

The place on the dial to find Chip Shop is 905 clockwise long wave. It also goes out on 568 and the medium wave — frequencies very close to one another so check in the Radio Times.

Amateur radio fans should turn to 144525 megahertz to join Dragon on Sunday evenings. The first Dragon talk place on the 1st January from 11.30 to 12.00. The net was started at 11.00 but organizer R A Davis says that "even an hour is hardly enough."

Again, from participants in the net there is a wide range of listeners. Stations join in from Leicester, Loughborough, Nottingham, Huddersfield and Leicester. And most can be heard over a radius of 50 miles.

Some participants are looking at new ways to allow Dragon to Dragon link-ups on the air and the organizer promises "no doubt we shall soon be enjoying the fruits of this network."

## Flex promises portability

FLEX has arrived for the Dragon 68 — in a version which promises portability between fixed disk systems as well as reel machines.

London based software house Computerhouse has licensed Flex from the US firm TSC Computer Design. It is selling Flex for Dragon Data type disks and has also licensed other firms to sell versions for other systems.

Previous Microsystems is selling a version for its disk operating system while Computerhouse Systems will be selling a version for the BBC B.

Ted Ouyehou as Computerhouse points out that this means the Flex will be "portable" in applications software across machines and across systems.

The range of software available



Computerhouse's Alan and Ted Ouyehou — driving Flex

also for Flex is one of the things that impresses Ted the most. "We state it and Flex has got it," he explains.

Flex at £75 is now set to fight a duel with the other main system for 68009-based

machines OAS.

Dragon Data itself is marketing OAS (reviewed in this issue) which is a multi-user multi-tasking system. Flex on the other hand is aimed more at single users

running a single machine. As such, Ted argues, "it is by far the easiest to run."

Help for Basic programmers has also arrived from Computerhouse in the shape of three new books of software — Dynamix, Dynamism and Dynamal.

Dynamix is a Basic compiler used to make programs up to 10 times faster. It does this partly by exploiting the internal 16 bit capabilities of the 68009 chip.

Dynamism combines lines and steps independent from such as BASIC statements from programs.

Dynamal is available on cassette as is the cross-reference utility Dynamal. Both are included with Dynamix itself which is available on cartridge or disk (Dragon Data version).

## EDIT+

- EDIT+ is a full Screen Editor and Programmers Text Kit. It's an excellent aid for writing programs in BASIC and is easy to use for the novice as well as the experienced programmer. EDIT+ includes all the facilities of HI-RES. Up to 23 lines of your program are displayed on the screen and can be changed by overtyping, inserting, or deleting characters. Functions include: Find String, Change String, Copy Text, Set Specified Limit, Scroll Up/Down, Append from tape and Enter Basic Command. No Dragon is complete without an EDIT+ **£34.50**

## HI-RES

Plug the HI-RES cartridge into your DRAGON and you will immediately see the improvement. The screen displays 24 rows of 56 characters with proper lower case and BASIC words as normal but with extra features. Selectable character sets (English, French, German, Danish, Swedish, Italian, Spanish), SPRTG Graphics, Resizable Characters. Improved keyboard action with autorepeat allows faster typing. Graphics and text can be moved on the screen. Suitable for educational and business use. **£25.95**

## SOURCE TAPES

The following programmes come with both source and object code. They can be used in conjunction with DASM or on their own as individual programs. It's a great way to build up your software library. Each tape represents excellent value at only **£5.95** each.

1. DISASSEMBLER
2. GAME OF LIFE
3. HI-RES SCREEN DUMP FOR CPROM
4. HI-RES SCREEN DUMP FOR SCROMA

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## DASM

DASM is a versatile assembler designed especially for ease of use on the DRAGON and allows you to assemble machine code while still retaining the full use of BASIC. Supports all 6502 instructions and modes. Allows any length for labels (the first 5 and the last characters are used). Full support for subroutines. Recommended for the beginner. **£18.95**

## DEMON

A powerful machine code monitor which allows you to delve into the internals of your DRAGON as well as helping you to debug your machine code programs (and BASIC programs using PEEK and POKE). Includes: Easymove/Change memory, Easymove/Change registers, Print Screen, Set Breakpoints, Test Memory. An essential tool for all machine code users. **£18.95**

## DASM/DEMON

- It has all the features of both DASM and DEMON in one package. DEMON is the natural partner to DASM, complementing each other perfectly. Write, test and use your programmes without the bother of reloading. It is exclusively featured in the new book by Iain Sinclair on Dragon Machine Code. It is the ideal combination for the machine code user. **£30.45**

## BUSINESS SOFTWARE

The following MSF programs are now available for use on objects with the HI-RES 51 by 24 Screen Database. (Balances, Accounts, Stock Control, Invoices/Statements, Mailer, Address Book). Also available: Home Accounts, MSF Calc. **£18.95**

## BOOKS

- Books and Extras
- Introducing Dragon Machine Code by Iain Sinclair **47.95**
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- Logical operators: AND, OR, NOT
- Conditional formulae: IF, THEN, ELSE
- Trig Functions: SIN, COS, TAN, ATN
- Log Functions: LOG, EXP, LOG
- Misc Functions: INT, FIX, ABS, SQR
- Range Functions: SUM, AVERAGE, COUNT, MAX, MIN, LOOKUP
- User defn. operator
- User definable control codes
- Individual column attr settings (1 to 255)
- Adjustable scrollrate to read data from without scrolling screen
- Hide columns or rows
- Alternate printout selectable every cell
- Backup/print formula every cell, every column
- 2 format: corresponding profile and graph signs
- Scientific notation, fixed point and integer format
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# DRAGON 32/64

## TANDY COLOR COMPUTER

# Software scrutiny

John Scrivens takes his software chances



AS I BEGAN to look through this month's collection I thought I was in for a top through the New Arcade. Unfortunately as I discovered after an evening's exploration, the new games that appear in arcades haven't yet reached the Dragon and many of the programs are refreshed versions of ones that have been on the market for a long time. I realised I should have kept my mouth shut about yet another *Invaders* tape, as that would have caused felling at the editors of this little bag. (I think it was planted secretly by the editor to test my sanity!)

Last month must have been the first time *Dragon User* started that I didn't have any new Microdeal programs to review. As I was finishing the last paragraph an enormous parcel of 12 level releases arrived from Cornwall, and these are included in this month's review. As usual there are good ones along with some more lightweight offerings and one or two that are a little suspect.

## Brain teaser

After the success of *Space Shuttle* Microdeal has acquired a Tom Mix program called *Air Traffic Control*. The display is similar to the materials in control towers, and shows two runways that cross each other. Small planes appear up to ten at a time and when they cross the screen there are no problems. But *Randomly Placed Vehicles (RPAV)*, that can be controlled by you. After selecting a difficulty

level and plugging in the right-hand joystick the display shows 16 control screens which is surrounded by various instructions. There are seven modes of operation that determine how you can control the planes, and the object is to land safely any that fly across the screen as well as launching those waiting to take off.

The joystick allows you to move a tiny plane around the screen and pressing the fire button allows you to land onto the plane, you wish to control. Using the joystick move the carrier up and down, a little menu display allows you to alter the compass heading, the winged and the altitude. Although it took some time to get used to the controls the 12 stages without too manual actions race at the things that are likely to happen. The only interesting thing about it was the statement that you could watch the display until you were ready, and then press reset to start the game. Don't do this as you lose the program immediately!

I found it was fairly easy to control planes waiting to take off, but the higher levels of difficulty have you controlling a dozen or so planes at a time to land. Although I prefer flight simulators this program is quite good at taking the brain. I'm not sure how accurate a simulation it is, but the new modes are probably close enough to put you off flying to Spain for your holiday next year.

That ingenious American programmer Ken Ketch (author of *Phantom Ship*

*Escape* and many others) has been at work again. In *Dragon Ranger* you control a small figure who has to collect 12 keys from the ends of five floors of a building (*Phantom Chamber*). Using the joystick you have to avoid such problems as floating Urns, Radioactive Bats and Moving Tiles. You can fire a laser gun to destroy these monsters, or you can jump and duck the monster from hell. Once through the screen you are faced with the Acid Chamber. This consists of rows of stepping stones and the occasional chest of treasure. Unfortunately large drops of acid fall on your head and not from the floor and there are always the demons.

## Better than Bonks?

Although I don't feel it is his best, something has a more basic version of *Bonks* this game is hard to beat on the upper levels, and does show some originality.

*Drill Assault* is yet another game from Ken Ketch. It doesn't have too promising a start, but soon turns up a hole at any sample rate appears. Rather similar to the beginning of the arcade game *Phoenix*. After these however some other job looking robots descend on you. If you can destroy these you have to fire with some automated cannons, each of which is called a spring. I always thought that somewhat came between winter and summer in Australia. These springs are similar to the sample rate and the robots as they bounce up from the bottom bottom side.

—It solar you out of existence. Again, I feel there are some startling things, and it was too much like several other games. In spite of this, it is well written and fun, so if you don't have a similar tape, this one could find a place in your collection.

### To boldly go . . .

In the dim and distant past, about eight years ago, at least if mine are worked for a company whose exact name escapes me (something like Ball), I seem to remember being showed the art of playing miniature games involving the movements of a system. Sliding little pieces, it sounded like spots on video going along, provided you were told what to do. You were playing it, but I'm sure it is a long while extended to that happy place in the store where all our software games finally go. When you pick up **Space Fighter** you could imagine that it is another whole whole special little Microbot. I

you look at the price tag on the back of the little packaging, you will see that the object of the exercise is to destroy the aggressive fleet of Rogue Space Cruisers which have overrun the Universe. When you discover further that you are the captain of the starship *Enterprise*, and can control every factor (from guided missiles and "phasers" you begin to realize that this is a fairly disguised version of Star Trek come back to haunt us. Only the market has been changed to protect the innocent (or the guilty).

It is more of a medium speed game rather than the high speed decisions that the pioneering describes and the Kingdoms Cape Kingdoms really rather a big strategy all though when you also there are in excess of 200 different you will understand that your task is not to mope. This movement is accomplished by using the eight joystick, although the keyboard is necessary to offer your shields and fire phasers and this increases the difficulty of the game, as does a docking maneuver that has been introduced. Hardly original, but those of you who must decide go will find this an entertaining version of an old favorite.

I wish I could say the same of the next game, **Space Raiders** should be assumed. "Edgar's Revenge" if you haven't yet bought invasions for your Dragon you could say this version is as it is good as bad as any other. All sorts it is there, descending about your ship, in the letter-forwarded features and few most like the games, this is available with black ball or green backgrounds. No more games I provide I'll get that little's review in its time. —ruff said?

Imagine it will know for its Spectrum software, and last summer I can recall playing its game *Jumping Jack*. So months later in the game of Leggett the small hero returns to try to find or maybe he heard on the Dragon. If you haven't seen the game before, you'll soon find that although based on a right idea, it gets to be quite tedious.

For some reason *Jumping Jack* has been renamed *Jumping Lenny* through the game in all other respects looks like the Spectrum version. The very best

hunger appears at the bottom of the screen with a light level, above him and has to progress to the top by leaping through gaps which move along the different levels in both directions. Should he fall through a gap, he will become unconscious for a few seconds and control be moved. The same thing happens if you make him jump when there isn't a gap over his head. Because of his habit of falling everything is split up to his head a better name would have been *Yumping*. Yes, especially in the image software comes from Liverpool. If you are unable to jump enough, you may reach the top and be faced with another screen full of moving gaps. The problem now is that other characters are out to spoil Lenny's fun, increasing in number from one to 20 planes, single-taking numbers and other events that themselves against your final. A pleasant change from alien chasing if you can cope with the high frustration level.

<b>Ali Traffic Control</b> Danger Ranger David Aspinall Space Fighter Space Raiders Eight Ball Pebble Gardens Dragon Hunt Shoreline 00 00 inch	<b>Microbot</b> at Tronix 00 00 inch Comet
<b>Leggit</b> 00 00	<b>Imagine Software</b> 8 St Thomas St Liverpool Merseyside
<b>Fishy Business</b> 00 00	<b>Simon Under Software</b> 17 Norfolk St Brighton Sussex
<b>Phorb Finish</b> 07 00 00 00	<b>Pecksoft</b> Preston Carlton-on-Trent DE15 0BN
<b>Knightpel</b> 00 00	<b>Byword</b> Compton House Farnham Rd Market Harborough Leicestershire
<b>Teenage War</b> Toni 00 00	<b>Reed Shepherd</b> The Arcade 20-22 Elmwood Lane Coppertown South York
<b>Puzzler</b> 00 00	<b>Shards Software</b> 108 Elm Rd Sheff Sheff

With the increase in popularity of pub games is a fairly surprising that computer versions should appear regularly. What is surprising is that they should all come so well after all the state involved in a game of darts are difficult to translate in a computer keyboard. Microbot has a revised version of past called *Eight*

*Ball*. Although a player on the packaging that it is a full colour, the coloured screens are seen if you choose a black background. Luckily the darts and spots are only in one colour so you don't really need the colours that would be essential in any shooter.

Setting the balls in the triangle is achieved from the keyboard, but subsequent control involves the joystick. This can position the cue, select spot and power of the shot and move the cue onto the ball. The shot is in the full-size game is to see if you balls another sign ball before your opponent can. You can turn your turn until you fail to sink a ball of your own colour or sink the right ball too early. Computer simulations are superb when they allow you to practice in the impossible or even the mildly dangerous, but that surely doesn't include pool. In spite of the clear display, one case of playing, I feel that people would prefer the real thing. You also need two people to play the game properly — if you could have played against the computer the program would have had three parts.

If you go into a store to play in the land from the back of the West, find the to the lateral reality put the Microbot, and the similar due to the video machines in the background, control you that we live in a different world. Up until the game and people needed in the only electronic sounds were those of realistic sounds clanking from the table. *Football* from Microbot as an attempt to recreate those long gone days. I suppose my criticisms of Eight Ball could equally well be applied to Pebble. Certainly the displays are clear, different and lively, available sounds are accurate and the ball moves at a very modest manner. There is little in the way of skill involved in playing the game, however, as the only control is the few buttons on the pad, so this doesn't expect of the long list as well as the fiddlers. There isn't any of the quality of a real portable game, perhaps if you play and there is no doubt that TLT sign telling you that you've gone too far. It is just rather boring watching the ball bounce around the screen and it's difficult not to score high.

### Daring Dan

Hit on the footstool of Love in Space comes the first part of Salamander's *Dan Diamond Trilogy*. **Fishy Business** (for those of you who missed parts one and two, this last-only adventure game concerns the exploits of one Dan Diamond, the one in Los Angeles detective in the 1940s based rather loosely on Dashiell Hammett's Sam Spide and Raymond Chandler's Philip Marlowe. In the last episode, *Franklin's Tomb*, Dan Diamond gets a message for help and ends up exploring a mythical cave crypt under a house. After spending some time wandering through the basement, Dan gets desperate and shoots off into Space, where he is lost for the second game. *Fishy Business* uses the same screen format — a description of the present location, a current inventory in





4) and an input area where you can enter the chosen direction.

Perhaps I was thinking more logically when I played the game, but I seemed to get dumber a little quicker, and the humor seemed better than in *Lost in Space*. To go into too much detail would spoil the fun (!) of the game, but be prepared for underwater gloopings with Precious Anemone and a sea-mon called A. White. Lots of Tridents. If you can cope with red bearings and blue goggles, you will enjoy this game greatly. I believe, entirely on location in Brighton Aquarium.

**Now back to two more arcade spaces:** *Hyper-Manifest*. *Obscure* is very similar to the start of *Devil Assault*, in that there is a horde of angry creatures that wait about at the top of the screen. They break away and swoop down on you, firing missiles as they come. You start with a protective shield that disappears rapidly under the onslaught, the amount remaining is shown on a scale at the base of the screen. The only novelty in this game is the ability to cancel a missile after it's been fired. All in all, it's an average shoot 'em up game, with nothing in particular to let it stand out from the others.

**Dragon Hawk**, also from Microdeal, provided a much more interesting storyline, and although you don't have the chance to change the ball level, it's a more complicated game. The display shows a screen full of fish, great ones, junkies and herons. You control a little man, *Wendell Wiltonham*, who runs backwards and forwards along the bottom of the screen, avoiding the birds and trying to shoot at the herons. Before conservationists are up in arms, I should point out that one of the herons has just carried off your friend *Freddy Paddy Peeper*, and is about to drop him from a great height. If you can't hit the heron (and miss *Freddy*), you can rush to the side of the screen to collect a basket which is used to catch your friend before he splashes himself into the ground. As you can imagine, the game gets quite hectic, and you have to think you can shoot and catch you should want.

### Spacefighter games

The last tape from Microdeal is a variety of *Scramble*, called with great originality *Scramble*. The screen splits from right to left while you fly your spacefighter over a mountainous landscape, and through a cave system avoiding enemy rockets like the strange convention in all versions of this game that in order not to run out of fuel, you have to bomb the enemy's fuel dumps. This display is reasonable, showing the landscape, the particular level of the game that you're reached and the number of planets left as well as your score. I found it harder to reach the upper levels, probably as I was using the joystick option which, as I said earlier, pointing the space bar to drop bombs, in the end I put my Dragon on the floor, and used my leg bar for the purpose. I think I played *Wendellham* from Dragon Data to this version, although both have their good points. If you want a copy of this game, it's probably a good idea to look at both.



*An Traffic Control puts you in charge of Runways, Parking, Mileage*

When I saw *Photo-Finish* from Peaksoft, I was afraid I was in for a run of low-mid home racing game, complete with low resolution graphics. The start is certainly similar to other race games, with the opportunity to enter the racers of up to four punters, and to bet up to £100 on the horses. The horses haven't yet set a race, so they have no color, and the first few races are a matter of luck. When the game really starts is at the quality of the displays. The horses are shown in great detail and the race itself across the screen. At the finish you can choose to see a photograph (actually an image) of the corner of the screen, and the race plays gradually back up a good picture at the time to give you some idea how the horses sailed the starting point. If you enjoy the thrill of the race course, but know little more than how to control the Derby winner with a pen, then you should find the program instructive as well as fun to play.

Also from Peaksoft is a highly original game designed to warm the hearts of environmentalists everywhere. *Daisy* is an arcade game that puts you in the role of an agency with few budget checks at hand. The food is strictly self service, and can only be obtained by drive (coming straight into the

river that passes by your tree and flying home with a fish in your beak. All the while this is happening, you have to protect your nest from poachers, who continually attempt to climb the tree. You start with two bees, and if you cannot deliver a fish to the nest within 30 seconds, you lose a life. Although you can fly anywhere in the upper canopy to enter the water, you must fly very high, then drop like a stone by pressing the fire button. This is a chilling ag game, and Peaksoft is to be commended for thinking up a new setting.

Last month I enjoyed playing a naval warfare tape from Beyond Software called *Up Perspective*. This complex game involved making a sailing tactics on area of sea, and you could choose to be the commander (by the submarines at the surface) or the *Submerged* is played on a similar area, but most of it is land and water. It is divided up into many small battleships, which gives you six possible directions in which to proceed. The cursor keys move the sailing area about, and once though you can move you the whole field of battle, there is a little map on the instruction sheet. This consists of a piece of folded A4 size paper containing all the information you are likely to need (including any letters



Although it is beautifully produced in full colour, it's difficult to read, and a booklet would have been easier. The directions are clear, it is well commented, and you can choose to play against another human or against the computer.

Each army has 16 pieces, comprising four heavy tanks, five light tanks, and six platoons of infantry. It is possible to recruit more men, and you can melt lay in the field. It is miserable to give such a complex game the description of reserves, even the time of year plays a part with men and snow taking their toll. The display is symbolic rather than detailed, but is perfectly adequate for this type of strategy game. Considering the price is only £8.95, this game is well worth a look and makes good use of the screen and display. Perhaps they'll bring out a more powerful game next time, then they'll really outpace.

When the Dragon first appeared, it had software that was written specifically for it and apart from a few exceptions, not many programs could be bought in versions for any of the Spectrum, the BBC and the Dragon. Recently this has changed and with the growth of software houses, it is probably economic to simply produce a



Post/Final gives you the excitement of the track.



Pennsylvania Tower: Count Kropke's tower.



Perfect-looking long-gone days.

a different computer, or even to struggle with the job yourself. Because people prefer programming on one particular machine, and are able to use its good points and disguise its little faults, the is not always successful. One software house that has managed to make a satisfactory conversion is Richard Doughty, which has been willing to selling more adventures for the Spectrum for some time.

**Pennsylvania Tower** is based on the traditional adventure theme of exploration and treasure collection. It is set entirely in Count Kropke's tower, a fantastic place inhabited by bats. There are five levels, all represented by three-dimensional scenes. At the start you are shown a plan of the maze, and you can come back to this at any time by simply pressing a key. The dungeon level is dark, flaring in maze-

running, so there's nothing nasty to jump on you here. When you finally reach the end to this level, you are introduced to level two, and here is where your problems begin. There are at least 20 bats to be killed before you can reach the next floor. If you reach the transportation point without finding a switch, you are moved somewhere at random. If you've just descended your floor plate, this can be very frustrating!

Eventually you confront Count Kropke but his every last night TV screen knows all you need is a chain of pearls and a silver cross, and even Christopher Lee cowers in the corner. Although this doesn't require enormous dexterity or brain power to solve, the game is fun for all ages, and should prove too enlightening, even with a full moon in the sky.

Shard Software has been producing interesting programs for some time, and although its early tapes didn't seem to have anything too special, the material produced shows plenty of imagination. Last month it was *Pennine's Day*, and this month it's *Puzzle*. This game is a computer simulation of one of those puzzle games where you move 15 pieces around a little square frame. In *Puzzle* you can choose from 1200 games, with either 12 or 14 pieces, changing colours and different levels of difficulty. This gives you less time to ponder on which of the shuffled pieces must be swapped if you're using the computer, except for you, and the puzzle becomes even more confused.

You can also choose the pieces to be rearranged. There are four choices: a basic flag, a cross, a dot, and a fish. And this program is excellent in representing memory skills for shapes, and provides a challenging and novel game.

There isn't too much that's completely new this month, but there seems to be quite an assortment to suit all tastes. The programming standard is improving all the time — all that's needed are some fresh ideas. ■





EVEN A HARD-working software reviewer has to get away to the club for a bit occasionally. I am no exception. As I exited my home (the keyboard) I overheard the fellow talking to an audience of so interested patrons about his life in the Software Secret Service. Let's listen in shall we?

In disguise, his story begins. I become the Software Secret Agent off an another deadly mission into the hinter lands of softwareland: spy top secret equipment including some of the old stein carts, a computerized left brain to right brain machine and later (placed in case of alert) a subcompact portable computerized recorder and standard log book of popular myths of human kindness gaming paper.

### Top secret

The mission was commissioned by elite other than the CIA, better known as the Citizens against Interaction in Arcade computer on game to investigate adepts as the mystery one games in microcomputer gamers. The nature of the assignment was so secret that the guy who briefed me wasn't allowed to talk.

It was simple: all I had to do was investigate rumors that Scott Adams of Adventure International (USA) would launch a fully computerized software had been kidnapped by Bowhead the notorious international criminal of horror sleeping 100 years and liberating.

It was FBI investigation revealed Adventure International's new Sea Dragon the secret switch by secret possessors Wayne Microcomputer and Terry Galtman has been converted very successfully to the TRS-80 color computer. I must confess that I am among those who embraced that game enthusiastically. It is as if you could see for a state of the art software.

Sea Dragon succeeds where others have failed as far as combining elements of different popular arcade games into a coherent new entity. By giving unlimiteds with free access to the dynamic duo of diverse computerized based the plenty of all but the most oblique emulative to Bowhead Vanguard, and other can't stop legends.

Here's how Sea Dragon works. The software is launched from shallow water

into a sea of floating mines which (most conveniently) float up to render her to underwater. Ah, but she is not without defenses. The forward tubes spit out an endless stream of deadly torpedoes that are quite capable of destroying these mines. Chained or unchained they are both points to the player.

As the densely executed sea floor scrolls under her keel, Sea Dragon makes the heavy dog duty to maintain. If too many of these spots to the game, the terrible bombing would have scored a lot to with me. But not content to simply be good I've added other elements.

First of all, as is not unusual so frequent surfacing is required. Also the automatic-prod scrolling seabed which makes up the sea way causes Sea Dragon must follow in thought with events contain big life situations which fall into can do in underwater elements. And what matters: game would be worth to call without butterflies to blow up? Then there are EATs (Enemy Attack Targets) which fire at random as you pass. Not all altogether safe way to travel by Sea Dragon if you ask me. Then there is a reactor (possibly owned by Bowhead) to monitor him? which gives radioactive threats and is protected by a large neutron shield. Inspired by a work force from and from pre-nuclear plague carries at airports in 70 cities.

Sea Dragon's ability to blow things up extends to both the horizontal and vertical planes and allows a lot of room for growth in skill level. Your arcade machines will have to be dragged away from the computer but systems this program. It is a rather a challenge to achievement an achievement and a fair bag for the money — all talked up into one really illustrated pageant in which the Adventure International executives and his lovely daughter a fine poster quality submarine come to for hanging on a computer room wall.

All this was useful information as I set out to rescue Scott from the clutches of the Great Evil Villain of the Month, namely Bowhead. I look with me my patented Microcomputer Microprocessor equipped info-magic Greenwater Destroyer and a closely designed Red Guy Boat to guarantee to fool any evil plot.

When I arrived at Bowhead's mansion

I noticed that the lights were dimming. Well, I was late! I sneaked through the corridors to Bowhead's laboratory. The land he was torturing The Prince of Pezzes by making him read back issues of Popular Mechanics Monthly.

I turned my head Guy Gunter squarely to the scuttling barman and tried. But the boys bounced off and melted down my gun. Then he ordered me to drop the bomb or he'd turn up the power and torture poor Scott to death. I hesitated. He insisted for a copy of The Psychology of Mind Processing as it relates to preparing reports at Congress. I knew I was beaten. I capitulated. I dropped the bomb and surrendered.

Ah, but I've beaten you! Bowhead roared triumphantly.

But he forgot to spare his mouth and let out a series of pure joy. I tell him have both names of my little of Harrow Kershaw's Gumball paper.

Oh no! he yelled. Can you Bowhead says I. From now on you will have to be loyal to everything you meet. No really better, he suddenly decided no letting. The little of Harrow Kershaw's Gumball have no attitude.

He left the lab a certified doghouse and the last I saw of him, he was heading for the coast in his jagged study to perform massive good deeds in the Great And he I tried to humanity lost.

### Clever capers

"I missed Scott over to the care of his Sea Dragon for the long voyage back to Bowhead. Who was that doghouse owner? I heard him mutter. Obviously that dated from me reading the instructions to Fifty Acorns Games for your Dragon. I shouldn't to report. A good ship's worth will come through. I And wait until the CIA gets my list.

When I hit agent had finished the story I left and went home to verify his findings about Sea Dragon. I could tell to one who could confirm that it would run on the Dragon at press time but I believe we'll see this and many other fine American color computer programs installed and released in the fall.

Max asked me if I wanted to go for a ride on that submarine. I told him to keep away from the Deepwater switch or I'd have him doing bubble sons on a Sinclair machine.

He had agreed. So he did.



# Plugging into Prestel

*Prestel explored by Keith and Stephen Brain*

PRESTEL is a computer database run by British Telecom which can be accessed via the standard teletype network. Although it has now been in operation for a number of years and currently contains over a quarter of a million pages of information, it appears that it has not taken off as well as was originally anticipated.

The Prestel database is made up of pages called the *Costar* and *Oracle* which are provided by many different individual organisations. However a major part of difference from ordinary telex is that Prestel is interactive. This means that not only can you view the pages but you can also actually communicate directly with other users at the system.

Microcomputer Associates has now developed an interface cartridge for the Dragon (over £100) which contains an integrated Prestel terminal which allows Dragon owners to join the growing number of micro enthusiasts who access this network. However, to use Prestel you need more than just an interface to your computer. First of all you need a modem which converts the computer signals to ones which can be transmitted via the normal teletype system, and secondly you need to pay British Telecom for the privilege of using this network. The cost of the cheapest suitable modem is around £50 whilst current Prestel charges are £5 per quarter for domestic subscribers and £15 per quarter for business subscribers with a further charge of 1p a minute up to eight on weekdays and Saturday mornings.

## Useful services

Once you have paid these charges you can call up many Prestel frames without further cost, although you still have to pay for certain pages. Within the Prestel database are some specific areas particularly aimed at microcomputer users. The most well known of these are *Microcal* 800 and *Microcal* 200 which provide information and a comprehensive teletext-based service for a limited number of machines. *Microcal* is the main provided in this field and its service is only available to subscribers who pay nothing for it and is only £5 per quarter. As Prestel is not offering any teletext service for the Dragon although it looks now as if it plans to replace this one.

The *Micro Resources* Prestel and its built into a standard small cartridge which simply slots into the normal Dragon card image card and a one metre flying lead then extends to a (cheap) DIN plug which must be connected to a modem in your

telephone. A pack inside the box already contains a ROM containing the terminal software, a 5880P Asynchronous Communications Interface Adaptor (and the crystal) and other minor components.

When you power up with the cartridge in place you are greeted with a start screen which queries the screen format to be set up. This is because although all the frames and prompts appear on the standard text screen, a 40-column high-resolution text driver is used for actual communication with Prestel. Graphics PRMODE 4 is used and you have a choice of normal or inverted video in black/white (bwt) or black/green combinations.



The Prestel interface for Dragon users

As you may know Prestel 1 frames are normally coloured (but it is not possible to provide this facility on the standard Dragon because of the limitations on colours in the teletext display). Although colour in teletext is licensed for display purposes, frames will still contain colour despite warnings on and will appear in colour on a system equipped with a special video-to-colour card which may be available later. Once this choice has been made, you press on to the MAIN MENU which displays the available options.

### KEY FUNCTION

1. LOG ON OR OFF
2. TERMINAL
3. SAVE FRAME
4. LOAD FRAME
5. PRINT FRAME
6. DOWNLOAD
7. MAILBOX
8. OPERATING SYSTEM

Pressing '8' from the MAIN MENU always returns you to Dragon Basic from where you can load the terminal software with the BBC.

To connect to Prestel you select option 1 (LOG ON OR OFF) and then option 1 of the submenu (LOG ON). Next you must dial one of the Prestel telephone numbers and wait for a connection, high pitched tone (the carrier). Once this is heard the modem

must be connected on line and the screen prompts followed to display the log on frame which asks for your user identity and password. Provided that these are entered correctly you are now free to explore the contents of Prestel. All communication is carried out using only the numbers 0 to 9 and the characters 'asterisk' and '#' (hash) and most Prestel frames offer a number of choices from a menu. Once you know your way around the database you can jump straight to any page by keying in, for example, '0004' for page 000. (To make life easier for the Dragon user, '0000' can be used instead of '0' and 'ENTER' is implied at the end.)

It is simple to store a complete Prestel frame on to a cassette tape with option 2 and to reload this frame into the terminal again with option 4. Prompts and error messages are provided to guide you through this procedure.

## Printing

Provision for production of hard copy of Prestel frames is also included on the *PRINTING OPTIONS MENU*. The text on text can be printed out on any standard printer, and if you have an Epson MX or FX series printer graphics can also be easily dumped.

One of the useful features of Prestel is the ability to send electronic mail to other Prestel users. This has the obvious advantages of being much faster than the conventional methods, not requiring you to tie up an envelope (let alone a stamp of the correct denomination) and, working at any time of the night or day. Of course you are limited to communication with other Prestel users although the number of these is at least starting to increase as interfaces are appearing for many popular home PCs. The *MAILBOX MENU* is simply selected by pressing key 7 and displays a series of options:

### KEY FUNCTION

1. SEND MESSAGE
2. PREPARE MESSAGE
3. SAVE MESSAGE
4. LOAD MESSAGE
5. GOTO MAIN MENU

Messages may be typed directly into the keyboard, but it is better to create and edit your message in advance in the mod the start and end of the available message area are indicated by '+' and '-' which gives you an idea of just over 500 characters. The keyboard acts as a normal typewriter, giving lower case characters unless the SHIFT key is held down, and you can move around the field with the cursor keys, DOWN ARROW, rather than ENTER, moves you to the next line and editing is achieved by backspace over writing of existing text.

Once the message is complete, pressing DOWN ARROW returns you to the *MAILBOX MENU*. Messages can be easily stored to tape or re-loaded from tape with options 3 and 4. An feature which option 1 allows you to automatically SEND your prepared message to any other user (if you know their number). Provided that you remember to leave Prestel via the



More Resources: Preset unit is monochrome only (so don't be fooled by the monochrome box set - that's BASIC, not us)

➔ **LOG OFF** again you will be advised of any messages waiting in the mailbox.

Telephones promise to be a growth area in the future. After all, what is the point in building round trip shops trying to find a copy of a rare volume if you can simply ring up a supplier who can send you the program down the line immediately (but of course charge you for it a few pence later). You select the program which you want to **DOWNLOAD** from a menu on the telesoftware pages and then choose the **DOWNLOAD** option on the **MAIN MENU** which switches the header frame for the title. Once this has been found you are prompted to set up your cassette recorder

and the download proceeds automatically. Each tape is marked at turn and then you return to tape at an **RCR** box (as if you had used the standard Dragon Disc **CRASH**). A command:

"If all goes well and the library is returned without corruption then you will reload the program from tape with **CLOAD** as usual (and also **CRASH** if again in the normal compressed format). Corruption protection checking is included in case of corruption during transmission, and the software automatically makes up to three attempts to copy each page. In the event of severe corruption, an error message is displayed, downloading is stopped, and

you are informed to read off Preset.

The More Resources Preset unit is a very professional product and the well-designed software is easy to use with very clear user-friendly prompts. The only real drawback to it is the monochrome display, but if you are keen on Preset you should perhaps be thinking about buying a dual-card system instead. It takes you further than to the possible uses of your Dragon at a reasonable price. But at the moment a full-blown you in the old chapters and egg-station with regard to telesoftware as well there is an established root of Dragon (Preset seems to support them all not to any available). ■

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# The mutterings of your Dragon

and teaches you how to understand Dragon talk

SOME OF US humans tend to mutter away while thinking out a problem. How, you, do you intend a Dragon doing this? Well, those who claim it even Welsh Noddy I got superhuman hearing after all. The Dragon mutters in 6502 machine code.

Sometimes when most of us learn that microcomputers like the Dragon are just a bundle of memory supervised by a microprocessor (CPU), with a keyboard and video system added on so as to humans can interface with it. In the Dragon the CPU is a 6502C and the rest, its particular language for its thoughts. Other models have 2800, 6500a or other CPUs, each with its own machine language.

What about Basic? I have hope this book too. What about Fort? I answer for any other high level language for the matter.

## Basic speaking

Humans are taught these languages just as we learn our way of translating thoughts into words. The Dragon is taught Basic in fact by having some of its memory filled with a permanent dictionary. The Basic interpreter in ROM. It can use Fort if you wish it so by loading in a Fort compiler into RAM. Some business men have no high level language, all they know when switched on is how to read a disk.

Back to Basic and your Dragon's mutterings. What would you hear when it is running a Basic program?

Let us take an example where you have developed an empty dragon a game and have scored 200 points. You are player 1 and your score is variable 51. The program may say:

```
500 IF INT = 1 THEN GOTO 600
600 51 = 51 + 200: PRINT 51
```

The dragon get of the Dragon mutterings will say:

■ First line 500 first token is IF. Look for this in KEYWORD list. It does feature therefore no syntax error. It is in 1st position. Look up 1st divider address: goto line routine. Expect expression: an expression found: what? error. Look up 1st variable names table. Found no error: find corresponding value: should equal 1. Yes so catch line for THEN or GOTO taken THEN found no error: read next token: GOTO read: search keyword list.

GOTO found so no error. Look for routine address: routine: evaluate 580.

■ Look for line 600 in program statement table. First character not token so try LIST routine. Look for 51 in variable names found: no error: read character is = so no error: expression/operand: no error. Look for 51 in variable names found so no error: read value. Read character is + so evaluate 200 and goto ADD routine. Store operand to new value for 51. Look up PRINT in keywords found so no error. Find routine address: a following character a quote? no. Is number expression expected: goto new routine routine: look up 51 in variable names found so no error. Find output position. Call decimal conversion routine for first digit: why? Is screen memory of cursor position and advance one: repeat till number entire: read program statements for next line.

What is all this taken business? I have from the back row again. Well, most of our handle data as bytes. Machine language is bytes, characters are bytes, numbers are combinations of bytes. A byte is a numerical unit with a value from 0 to 255. In the case of characters, the ASCII code is used which stores numbers up to 126, leaving 128 possible values free. When storing a program the Dragon uses its keyword table to interpret these words and converts them to binary of values 128 through 255 which are so shorthand saving space in the program statement table. That is to say your program in RAM.

In case of this shorthand the Dragon has to look up what is the every time it sees a keyword, and keeps on checking for words. So Basic is slow.

## Direct talk

What would happen if you could break in on these mutterings and tell the Dragon what to do in its own language? Let us try to it.

■ Read from workspace 1 (517). Count game with 1. If equal set accumulator to 200 and give score increase routine.

■ Add into accumulator contents of workspace 2 (515). Store into workspace 3. Refresh cursor position: derive decimal digit and store it cursor: advance cursor and repeat till number complete.

This is a lot quicker and shorter because you told the Dragon exactly what

to do. It does no looking up, and no error checking. But if you tell it wrong, beware the consequences.

However, the adverb instructions you give are a string of numbers which have no meaning to the average computer literate mortal, not to a Vax20 or a TRS-80 Model 3, whereas the Basic version would. It's a pure Dragon matter but there are ways of making it more intelligible.

What do intercomprehension computers assemble and reasons have it even more?

Well they are machine-code programs to help you write programs, and they are all things the beginner should have no need to be aware of to pursue his programming. Let's look at their same advantages and disadvantages.

The Dragon has a Basic interpreter that tells it how to go about executing a lot of Basic statements. It reads them, looks up what to do, informing you of



Several assemblers are available

errors, and executes some standard routines in consequence without ever learning or improving the program. It is ideal for program development so you get immediate response from what you do.

If you had a basic computer you would have to write your program then compile it before it could be run. The computer does all the looking up and storing your instructions in a list of machine code routines to be executed in order of a later date. It checks for errors and you have to correct them and compile again until you have a program without any. I don't understand errors. You might still get "out of memory" errors, eg division by zero which might be detected by the run time supervisory program supplied with the computer. The compiled program runs faster and more efficiently but is still limited by the structure of basic.

## Assemblers

Special assemblers can be bought for the Dragon. An assembler accepts assembly language rather than basic and produces a machine code result. Assembly language is really easier to read than machine code. Each machine code instruction is expressed as mnemonics, as a word you can remember more easily than a number. You write them in order without regard to the numbers or address points, but by including labels you can show the sequence where to go when it needs to go out of sequence. You can give values to numbers and strings and refer to them by names, but even so your program needs to tell the CPU what to do at the level of simplicity of its own language.

A monitor is your access directly to the memory. You must write numbers into the memory cells directly. You can write machine language or data. A monitor is also needed as a run-time supervisor for testing machine language programs, rather entered as numbers or as an assembler. It can progress the state of memory and CPU registers after a run just as you might on SBC or in basic program, but it is not programmed to be as easy to control as basic.

So we have four levels of programming difficulty: each giving a bit of extra performance, the assembler being the most accessible. The computer allowing time to execute the machine code form, once debugged, the assembler giving a more accessible way of entering machine code, and the monitor which is needed to test machine code and can accept it in normal assembly language form.

Remember that! From the basic box, the assembler is and is a way to express a byte in two characters for four-level status (you can count an on-off lead and low bit, or an if we take out code off and ignore number and flag bits). Label your flags and smaller bits from 0 to 5 and finish left over A B C D and F. Now rather than counting up to 39 in hex-goes we call hex FF or 255 in decimal.

You still wish stage goes code performance. How does writing on a monitor improve on an assembler? Ask the bright one of the book.

Not a lot really but if you have loaded memory in which to keep instructions monitor gives immediate feedback (source code) and the machine language (object code) you can't decide the big deal.

What is it to monitor then?

Well in hex it's 2A for those who read English SF but seriously I depend on your numbers. If you are out to write calculator games for the market, I would advocate really getting to grips with machine code and find a monitor with full flags and shuffles. There is at least one which accepts mnemonics singly and looks out displacements so you get native assembling without doing long divisions of the four space with source code.

Where do disassemblers fit in?

These help you out of the hexcode-maze of bytes. They can recreate assembly language from object code, but of course they cannot invent the imaginative ideas you might have used to find your way round the original fixed cases of hex. Some happen when you get used to assemblers and few have a bug that forces you to examine memory with the monitor.

Are you seriously recommending learning 5502 code in hexadecimal form?

Not outright, but it comes with use if you do it just as with any foreign language. Well, I suppose I learned 5502 code and have now got a good grounding in it with a little help from a couple of hex- and being able to read it off a hex dump display certainly helps in time of trouble. Also writing it, this takes a lot of typing and you can see much more of it in a screenful.

## Macromon?

You may be one of those Macromon Macro Macromonists then that various programmers despise when their code calls using the highest level language possible.

Agreed. Their technique is great for complex business problems. Having written it, it is then when the greatest accomplishment of the 5502 is to multiply two six-digit bytes together and really try counts for a bit that somebody has to write interpreters, spending systems and the like and the public like games.

Why is this basic is an unadorned language: what about machine code?

Machine code is as unadorned as a pile of bricks, but you can build how you like. Sixteen registers form, in brief. We write hex code you can build small routines, link them into larger ones, and then into a whole, or you can start the beginning and try to reach the end with as little deviation as possible in your choice.

Try a bit of Dragon mashing, as with it. ■

4 instruction decoder and ALU? The latter is responsible for arithmetic and logical operations coming between the instruction decoder and the accumulators. I use the plural because all processors can't multiply or accumulate as well as the rest one. The programmer need not worry too much about these just clocks on his mind.

## Visual knowledge

What the programmer needs to know to program in a processor's machine language tells and flows from parts.

The processor's instruction set, the vocabulary.

The processor's internal memory layout, the register.

The computer's memory map.

You will also need to know a lot about IO (input/output) which covers keyboard, graphics, graphics sound, cassette, etc, and at least form part of the memory map.

One other concept you need to get straight is the use of the byte. A byte is a whole number between 0 and 255, and consists of eight bits, which can be 1 or 0. The byte is the smallest unit of data the computer uses, and can be treated as a figure in a number. Our figures can range from 0 to 9, and to represent larger numbers we use two figures: multiplying the first by 10 and adding the second, and so on with further figures. The computer does this too, but with numbers to the base 256. It needs very few lights to cope with the biggest numbers we need. Addresses are not two bytes and range from 0 to 65 535.

In fact we find that for many programs we rarely bother with more than two bytes at a time, and particularly in machine language. The byte is very versatile: it can represent many things, such as:  
A boring old number  
A text character  
A graphics character  
A colour or even paper and ink colours  
A flag bit  
A group of picture elements (in 3-bit graphics)  
A graphics point co-ordinates  
A machine language instruction (or part of one)

The operations that can be performed on three bytes are called 3-bit operations. They fall into three main groups:  
Copying instructions — LOAD — Memory to Register, STORE — Register to Memory, TRANSFER — Register to Register (in 256 pointers all are called LOAD)  
Single byte operations — INCREMENT, DECREMENT, NEGATE, COMPLEMENT, SHIFT, ROTATE, etc.  
Two byte operations — ADD, SUBTRACT, AND, OR, EXCLUSIVE OR, COMPARE  
Single byte operations can be done on data in registers or memory in solution. Two byte operations almost always are done with one byte in the accumulator and the other in a memory or for 65 type processors, in a register. The result is to be found in the accumulator.  
All processors can also do 16-bit

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In addition, though in some it might be preferred to provide addresses and all can perform some form of "data transfer" others are less different types.

I have now listed all but one group of operations of the average processor, and you might be excited by examining what all the fun is about. In fact you might wonder how such simple operations can result in the marvelous your computer performs, particularly when loaded with a machine code game program. The answer lies partly in the group we have yet to discuss, but the main reason is the endless speed at which the operations are done. Just think that every time your cursor points to the bottom of the screen scrolls, and the processor has to read every individual character and write it to the line buffer. Do you perceive it as taking time?

I have said that all programs of any value require the computer to choose a course of action as a result of a previous operation. Normally the processor reads instructions from the program and executes them in order, using the program counter (PC) to follow the sequence. Stop, go, stop operation opens the programmer of the PC and loads it with a new value. The next instruction will be read from a different part of the program and a JUMP or BRANCH operation will have occurred.

This may mark the end of a particular sequence or routine in which case the jump will always happen, but all processors have the ability to perform conditional jumps or branches. When one of these is encountered the programmer is only directed if a particular flag is set or cleared. This of course depends on the result of some past operation.

### Flying the flag

There are four flags that form the main part of conditional branching, and it is vital to know which are affected by which operations. The simplest is the zero flag. This is set when the result of an operation is zero, and often marks the completion of a sequence of loops or that a particular condition is met, having compared two bytes and finding they are the same. From this derives the terminology of some processors — BRANCH IF EQUAL, meaning if the ZERO flag is set.

The carry flag marks carry or borrow at arithmetic operations just as we do with our sums. This can be incorporated in the next arithmetic condition or used to initiate a "branch". Carry also holds the bit shifted off the end by shift operations.

The minus or sign flag indicates the state of bit 7 of the result, which is understood to mean negative if we are dealing in signed arithmetic. Rather than regard a byte as a number between 0 and 255, this means instead a value between -128 and +127 and the upper bit is set for negative numbers.

Unfortunately the minus flag can be misleading for instance if we add +115 to +105 we get +220; however the byte representing +220 in normal notation has its upper bit set to 1, and would appear to be negative (-76) in signed arithmetic. To

cope with this, processors have an *overflow* flag that warns that the result flag is lying if a result from a signed arithmetic operation.

Conditional jumps are at the heart of the program structure and greatly facilitate the logic in your program. Either a jump for the wrong condition, or to the wrong place, sometimes making a valid instruction into a program causing a self-destructive crash. This is where many take time to learn and often to focus with as now containing error messages.



Another variety of jump-type instruction involves *subroutines*. These are jumps that direct to a much used part of the program and expect to return to the main sequence where it left off, exactly the way *OSCALL* works in BASIC. In order to call the subroutines at the next instruction of the program has to be stored before the value in the PC is replaced to cause the jump. This is where the stack comes in.

The stack is *RAM* used as a last dumping ground where data is placed and retrieved in a sequential basis. Last-In-First-Out, it is managed by the stack pointer which holds an address that automatically go to match the most recent data put onto the stack. The stack can be likened to a spring-loaded plate dispenser or rifle magazine — if you put something in, you have to remove it if you put in after it to get it out again.

In the case of subroutines, the jump or call stores the address of instruction the return address on the stack. When the subroutines is finished, the return instruction retrieves the return address from the stack and puts it back at the program counter causing execution of the program where it left off. In many cases you may want to process the contents of some other registers from data before by the subroutines. The stack can be used for this too; you push the register contents into the stack, it stores operation under management of the stack pointer. To retrieve it, it is popped or put it back (as puts your processor's preference, some seem to have it as *push* doing this always).

We can go a little further before the stability of the processor stops us talking generally and cover addressing modes. These do vary from one processor to another, but there is the effective address which just means that 18-bit value that represents all of the address bus when addressing memory. The 486 has the programmer gets it as a value, although just use it in *memory-relativity*. How the EA is derived depends on the addressing mode

of the instruction and is always derived from register contents directly or indirectly.

The simplest form of addressing mode, does not involve an EA at all, as it covers operations on or between internal registers of the processor, and is sometimes called *register or internal*. The register identification is implied by the code used for the result of the code.

The next simplest is the *immediate* mode, here the data is built into the program immediately following the instruction code (see page 10). No store or single-byte operations are allowed in this mode as they would affect the program itself. The EA in this case is derived from the contents of the program counter. Some 486 instructions can also be immediate.

Extended addressing is where the address other than the data follows the opcode, as the processor has an extended operation to do.

Some processors take the one stage further, *indirect* address. The data found is always a memory address that holds the data you want. In fact some processors (and indeed versions of other modes as well) and life can get very confusing, to those without a clear head.

The *indirect* post operations can be thought of as a special addressing mode, drawing its EA from the stack pointer, it stores data *relative* only.

### Registering

All processors have some register addressing modes where the EA comes from a register other than the PC or SP. These are most useful for table and vector processing. Most processors have single register addressing and a version called *indexed* addressing where the EA is the register contents modified in some way. The most common is where the *base* register is followed by displacement data which is added to the register contents to form the EA. This mode can be used for the *string* word, the register holds the address of the character to be moved and it is added into the accumulator using the *register* addressing mode. The character is stored into the higher *string* instruction, extended addressing mode with a displacement of minus one less a *string*. The register can then be *incremented* in point to the next character and the process repeated.

We have shown something about what the processor can do, and how it knows what to do it. We have not discussed the details of the processor's instruction set. We also know that each instruction is provided as a byte (or sometimes two bytes) in the program, often followed by data displacement or register and how the program counter keeps track of progress through the jumble of numbers, but how do we cope with the jumble?

This is not obvious to many, some more, and seems to prevent another barrier between language programming. Often we would like to write software just to bypass the three-instruction set to speak to the processor directly, then the accompanying activity is as bad as a bomb surrounded by sometimes killing you, but a busy. ■



# Moving up with OS 9

Keith and Steven Brain reveal the ups and downs of OS9

AT LAST! Dragon Data's long-awaited OS9 disk operating system and range of associated software have arrived in the world as part of a deliberate policy of moving applications into the small-business and professional sector where Dragon Data sees an expanding user base.

It remains to be seen whether small businesses can be persuaded to part with their hard-earned cash for such business software in the same time the arrival of OS9 is a major step forward for the computer user because who wants to acquire the most out of his Dragon? Certainly Dragon Data's pricing policy seems to be firmly based on the 'give it high and sell it cheap' notion in which Turbo and iMacros, and in comparison with many professional programs for other markets, its software prices seem to offer extremely good value.

## A serious system

If Sir Clive Kiddle thought of it first (as usual), we would be tempted to say that the step was a quantum leap for the Dragon as it effectively transforms the micro from a sophisticated toy into a very serious machine.

The OS9 operating system is the key to the operation of the Dragon's processor and to fully understand the significance of this development it is necessary to consider how a computer carries out instructions on the standard Dragon 32 or 64 the operating system which contains the commands interpreted by the computer as contained within the ROM. In the Dragon OS9 disk system is added further system software which is installed in ROM in the hardware. All of the routines in these ROMs are actually stored in the memory map at all times whereas with a totally disk-based operating system all of the routines are on disk and are loaded into memory as and when required. The immediate advantage of this is that you can have a much more compact operating system without losing much of your previous RAM.

OS9 is a sophisticated management system which enables you to get much more from your Dragon. As it was designed by Microsoft Systems Corporation in collaboration with Motorola (the designers of the 68000 CPU), it is an inherently efficient product which uses the capabilities of the 68009 to maximum advantage. A major difference between the OS9 CPU and 68009 is its incorporation of three instruction positions independent-code (PIC) which means that instructions can be loaded

and run at any point in memory. Thus the available memory can be used much more efficiently and several programs can be stored simultaneously.

In practice OS9 comes out of all of the housekeeping for you automatically with out any need for intervention on the user's part (you attempt its operation). Normally modules are loaded as required and then deleted from memory once their usefulness is ended. But when modules are called repeatedly these are simply be loaded into memory to save time. A full manual OS9 Operating System User's Guide is included and an OS9 Program Users Manual (written as yet) is held at ETSI. The details of OS9 are too complex to explain in the small space available here so we will try to give you the flavour of the system and point out what we feel are the most significant features as far as the Dragon implementation is concerned.

To run OS9 you need a Dragon with 64K of RAM and a Dragon OS9 disk system. When you use OS9 you turn your Dragon into a 64K soft machine and patch out both the standard basic ROM and Dragon OS9, although you need the latter to get the process to begin. You turn on the Dragon as usual and when the Dragon OS9 logo appears insert the OS9 system disk and enter the command 'BOOT' which loads the essential control modules into memory and sets up 64K of RAM. These essential routines are concerned with items such as input/output (I/O) management, disk control, keyboard scan, video display, printer and real-time clock. At this point you have 48K of memory left free for use.

The 'shell' is the part of OS9 which accepts commands from the keyboard and acts as the interface between you and the rest of OS9. Whenever the shell is waiting for an input the 'OS9 prompt' is shown at the start of the next line. The command line prompt starts with the name of the program to be run (which can be one of several different types) and once the line is entered the shell searches for the name first in memory and then in the disk or directory and finally in the user's data directory.

There are many similarities between OS9 and Unix, and perhaps this is an important concept. There are descriptions of the route to be followed by a command and are somewhat similar to the commands used by other systems, except that they frequently consist of a list of names rather than just a single name. Multiple devices (file shares) store data in separate files

which have names that are entered in a directory file. When a new data is first furnished a root directory is created automatically and sub-directories are formed beneath this in a tree structured hierarchy.

For example, the root directory of the standard OS9 system data contains seven files. OS9boot (OS9 boot), OS9S (OS9 start up), RUN32 and RUN64 and the OS9S directory contains a further series of files which contain the modules for 47 individual OS9 commands. It is sometimes a nuisance to have to specify a complete path to to call up a particular file, but this is not unnecessary and only a relatively minor inconvenience.

The initial startup file sets the normal Dragon text display with upper case letters only, but both upper and lower case (mixed) can be called with 'UPC' and without shift key. A number of control functions can be called by characters like the other key and a type-ahead buffer operates except when the disk drive is running. An alternative video driver, job during a 51 column by 34 line line upper and lower case display can be called by 'OS9'. However, although preferable it does not up-kill or memory.

## Modules and codes

Two resolution graphics modes are supported - PMODE 3 and 4) and codes are available to produce the equivalent of PMODE COLOR, PSET, PSET, PSET, MOVE, LINE, GET and PUT are the very useful commands. GET and PUT are reliable by two character joystick values can be called via assembly language system calls.

OS9 has a unified I/O system in which transfer of information takes place in the same way regardless of the hardware device involved. This means that I/O currently on selected is almost as direct without having to alter the program. (For example to divert output from the screen to the parallel printer port all you need to do is to add 'P' to your execution command instead of changing every occurrence of 'PRINT' to 'PRINTC'). This also means that programs are highly portable from your Dragon to any other computer using the 6800 CPU. The 'ACMIO' module receives input or output to the serial port and this can be used for instance to drive a serial printer or to transfer data from another device (such as another Dragon). No cassette driver routines are provided.

If more than one program is entered on the same line, supported by applications from these programs will be executed strictly in sequence. The second level of operation is the 'background' (B) which enables concurrent execution (two or more programs running simultaneously). Much of the time the CPU is simply waiting for some input and the efficiency of OS9 is much enhanced by interrupting which allows different processes to share CPU time and other resources.

Management is carried out automatically but special processes can be applied to different priorities if desired. As an

LOOK! ITS HERE AT LAST...THE ONE YOU'VE WAITED FOR...  
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# LOGO-ART FOR THE DRAGON 32

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LOGO-ART SCREEN-1

LOGO-ART FOR THE DRAGON 32



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SCREEN 1-24



LOGO-ART is a powerful graphics system for the Dragon 32. It allows you to create a wide range of graphical effects, from simple lines and dots to complex patterns and shapes. The system is easy to use and can be controlled using a joystick or a keyboard. LOGO-ART is a must-have for any Dragon 32 user who wants to create professional-looking graphics.

LOGO-ART is available in two versions: a full version and a demo version.

Full version: £6.95 (includes all features)

Demo version: £3.95 (includes basic features)

Both versions are available from Hobbs Software.

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■ **example entering CDR> P4** will show a process ID number (for example 305) and then prompt you to press a key to display the process but immediately return the CDR prompt so that another command can be entered. The final type of separator (:) sets up pipelines between concurrent programs so that the output from one automatically becomes the input for and has with perfect synchronisation.

Age Group	Percentage of Respondents
18-29	85%
30-39	75%
40-49	65%
50-59	55%
60-69	45%
70-79	35%
80+	15%

OS9 will support a messaging database a number of formats and the L2SMB protocol can also be used on the standard system to check for the correct password before entry is allowed. Even the file ownership and attributes which determine who may access the file and how it may be used. The current user identifier is automatically added to the file and ownership checking and writing can be restricted by the user. Finally we must mention the OS/2's new Customizer menu which allows you to change the system's look, configuration to suit your needs.

Undoubtedly DSS is a very valuable tool. The paper of which is well documented in the applications software development arena.

Basic-80 is described as an enhanced and structured Basic language programming system specially created for the latest advanced microprocessor used by the Dragon computer. In fact Basic-80 is neither a Basic/Fortran hybrid with an added bit of Fortran thrown in for good measure. One very important feature is that this is an interactive computer which gives a feedback of its compiled language and the state of use of an internalised language.

Although Microsoft's Color Basic (the standard Dragon version) is extremely easy to use and is rated for its excellent graphics capability, it was not written for it. In particular, programs written in Basic 65 are especially written to exploit the full potential of the 6502. Basic 65 is fully compatible with other programs running under G80 so that you can use it to produce files produced with the database package **File**, **Storacech** and others.

Basic OS is made up of some 120K of code and on startup 4K is reserved for workspace although this is easily changed with MEM up to a maximum of about 20K. On startup it runs SYSTEM mode when

you call `insert` with `DBO` and create the workspace environment. Programs are written and amended in EDI mode; the language is fully structured, and programs are written as procedures whose line numbers are optional. A syntax check is automatically made at the end of each line and an `edit` is further error check is performed when the procedure is compiled. Provided the no-errors are found the program is immediately compiled to `inmemorycode` (i.e. code which is executed by the runtime engine).

When an existing procedure is edited it is automatically decomposed and the "Y" code address of each line is printed out so that the position of errors can be easily located. Programs which are automatically

fully printed to show testing. A wide range of editing commands (including search change and replace) are provided. Standard control structures are supported. In addition to WHILE DO REPEAT UNTIL LOOP END LOOP IF THENF and ON ERROR GOTO are available.

Programs can use simply **TURN** by name or **AUTO TURN** allows immediate execution after loading. If errors are found then these are dealt with in the comprehensive **DEBUG** mode. In particular **BREAK** allows you to set up breakpoints. **STOP** executes a program from source statements at a label and **STATE** lists the results of all active procedures. **TRIM** turns off trace mode where the compact table of each procedure is used more than is recommended to source statements and displayed before the statement is executed.

The RACE system allows you to further reduce the size and a complex line of your program by having either computer paid which removes errors and numbers, non-replaceable elements and so on. But since the procedure run this form is cannot be edited, it is suggested to be loaded into the computer although the code can be run from QMS at any time and secure. Speed up in the order of 50-80 percent is claimed for that water records on how much unnecessary material there was in the original record.

A Graphics Interface Module (GIM) written in assembly language is provided to give users access to the 8-bit facility. Designed under DOS, it is also run on the Russian-marketed computers. The

are SLOC (shows the address of the video display RAM) GDCR1 (=PORT) and JOYSTICK (a Color Based) No sound capabilities are included (apart from SLOC).

QED has very powerful mathematical techniques and can do second-order logic (see <http://hol.sourceforge.net>).

The TYPE statements can be used to produce a new user-defined data type which may use the standard data types as well as the normal Fortran operators (NOT, AND, OR, and XOR) bit-by-bit logic; operators are provided (INOT, LAND, LOR, and L XOR). Other functions include MOD (remainder), AIDR (memory address of a variable) and ALEN (variable name), SIZE (size of a variable array or structure name), GPR (size of the most recent word), DATES (current date and time), and TRAND (randomly taking space from a string). The usual `INDEX` command does not appear in the manual (listed in the appendix listing) although in fact it is actually present in the CMC source.

Files and IO are dealt with in a separate unit. CDS has commands INPUT (FROM PORT) READS CREATE OPEN CLOSE DELETE READ and WRITE are self-explanatory. GET and PUT statements are completely different from their Microsoft counterparts and read and write fixed size binary data records in files or streams. AVOID SEARCH changes the search. They are the primary I/O commands for the various devices and can be used to deal with individual records or whole data structures. As they use the same binary format as the actual data files they are much faster than READ and WRITE for most correct operations in and from ASCII format.

**Keywords:** child sexual abuse; disclosure; social support

Although we are not generally overly in favor of comparing benchmarks for different machines, a quick check of the standard (NetBench) comparisons revealed such a startling improvement over standard Design-Bench that we could not resist stating these facts.

A quick glance at the comparison table explains what a real-world task would add to the Dragon Curve in the worst case (every real number): the speed improvement is dramatic (reduction time required is 92 percent) if other costs are

[illegible]

**Background:** The current programs designed to reduce the level of maternal cigarette or alcohol consumption

16 bits are used whenever possible; the results are stored efficiently (induction is only 14 percent of the support level). Comparisons with some other engines are also very interesting and delightful and 16 bits are no substitute for good software.

Downloaded At: 11:53 11 September 2009

The Zilograph wordprocessing package is only available as a complete package and also includes the hard copy and diskette options (but at the total price is only £290.00 per copy). It comes with a hard copy and a complete set of manuals. The hard copy is a single or dual disk system, but on a single disk system, storage space is somewhat limited. So the software dictionary is on the same disk as the text files. A detailed manual is provided which explains the system quite clearly, and a video by Apple International is also provided. The manual is obviously not written specifically for the College and unfortunately the manual is very confusing in places as the examples given suggest that the default action (copy) is only from a diskette to the hard disk, but the hard disk can go up to 1MB, the others and the option can be selected, but only with 75 characters (which is

To use Xylograph simply install the GDS system disk with the Xylograph disk (change its development) to the new disk (`chdir /dev/chd0`) using the `chd0` volume model (`chd0`) and type `xylog` to enter "supervisor mode" where a wealth of options is provided which are selected with a moving cursor. This can be loaded and saved. Backup files are automatically kept and installation of this is difficult as it requires a disk image and is not included.

The example personal database will support virtually any type of points (called *tags*) (geographical location and any arbitrary modification can be carried out at the time or on a permanent basis) by calling the STIPES program. Even when the system is configured for a special printer, support (tag understanding or alternate fonts or a straightforward vertical call) will be produced by selecting the TTY option and files can also be specified to talk for handwriting. It is possible to PASS any command to DOS from within Stipograph which is particularly useful if you want to call out data (discrete) for example.

Selecting EDIT takes you into the EDIT mode where cursor control words and replace mode duplicate characters, insert and delete character elements.

can be printed out. A useful card showing the keyboard functions in cyrillic and control modes is provided. The current page number is displayed at the top of the screen, together with a line of dashes in and out the line length, and you can easily jump to any scrolling page. The cursor control and scroll keys are grouped in the traditional diamond pattern, and using the arrow cursor takes you into INSERT mode, where text can be entered. It is possible that you are in insert mode as the current line is now displayed with a row of inserted hashmarks, and covers the line with

Full page formatting features are provided and the effect of many of the commands is visible immediately on screen. Text may be inputted left justified, right justified, centered and be input before and subsequent to a full display margin that is impossible to move. Corrections can be made rapidly. Page numbers and footers may be displayed and page margins and indents can be changed.

Control Functions can be used from either escape to insert mode, with the driver key being used as control. CTRL-A calls assistance if you forget a command. CTRL-D, W and R delete characters, words or lines. A sets a line. F causes files and T causes to the next tab position. For different types of character modification can be specified (preceded that your pointer can accept them): underline (U), outline (O), superimpose (S), subsume (B) and isolate (I). These are normally not called by reverse printing of the text, but they can also be checked by the VIEW command (V) which replaces the text with different numbers according to the modifications called, and all modifications can be removed with /Z. CTRL-F allows you to remove the format lines from the screen so that more text can be viewed. CTRL-O allows the screen status to be set.

CTRL-G allows you to insert "ghost" hyphens into long words. The last control function (F6) allows you to put a name (disambiguating to any other you may encounter). Hitting the clear and break keys at the same time returns you to the package prompt.

To begin with, we found that switching between insert and delete modes was a little tedious, and that a problem that was not really a problem. The maximum memory allocation for Sylograph seems to be 640K, which only gives a total of 512K bytes for text storage (about six double-spaced A4 pages)—which is rather small. But last time we had to throw in another

Myosin domain/actin is also a very significant subunit system (the myosin subunit contains over 23% of cytosol and ER, are regulated by the inositol lipid signaling pathway, has a particularly high a kinase off between-lipidase and

The **Mailingrange** action has three functions. First of all it allows you to print any number of copies in a particular file. Secondly it allows you to list files together for printing as a single document with consecutive page numbers. Thirdly and so on. Finally it allows you to merge a list of variables with a list like the most obvious variables are names and addresses and for personalized create letters but there are obviously many other applications. As **Odin** is maintaining it is easy to test up **Mailingrange** in a background task, which proceeds even if you are preparing another document.

If you don't start this topic at your partner when you are visiting them you can simply direct the subject to a computer, say, that is always on the printed list. If you also have the PMS database you can use it to produce a list of specific links to be discussed with the host.

2000

The final part of the package is Spell-check, a very impressive program which rapidly corrects most word in your text file with the contents of its dictionaries and reports any words which it cannot find for possible correction. The modified dictionary contains an amazing 40,000 words (Roget's has 13,000) which are in a specially compressed format that occupies only a quarter of the space normally required. In addition it is easy to add new words (such as technical terms) to a user-defined dictionary.

If it's not really as found then the word is displayed and one of a number of actions can be selected. You can simply ignore the word or **A**dd it to the dictionary. Or the **D**ictionary Index if you're less sure of yourself. You can also **R**emove it if it's out of context or **F**lag it for later action. In many cases it is possible to decompose the dictionary to read the words but the normal Dragon data are too small to hold the results. Often, if it is possible to reassign supplementary dictionaries into the file, one is given every step (showing of added words) as it is possible a translation is also produced during this time.

We hope this article has given a taste of what can be done with CDO—some applications packages will have to wait for a later release. ■



Figure 1. The data gathering system &amp; drawing machine



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## Learning to experiment

**Peter Whittaker's concept for would-be architects**

HERE IS A project for all those who do not want to experiment with their Dragons but don't have the confidence to tackle complex circuitry. Rather than construct an A/D converter I decided to use the Dragon's built-in A/D device. This means that you do not have to resort to machine code to program the lightning. It is possible to connect a lightning to the joystick port and access it with the JOYSTICKS command. Whenever you use the joystick the Dragon converts the analogue signal from the joystick into a digital signal between 0 and 255.

Figures 1 and 2 show the synchrotron connections and the circuit diagram for a synchro. A constant 5 volts is applied to pin #6. After passing through the potentiometer, maximum setting the current returns to pin #3. Pins #2 and #1 read the

input voltage returning from the photo-sensing of the potentiometer. By using the A/D converter to compare these voltages (A/D set at 1 or 4) with (A/D) the computer calculates the position of the potentiometer by changing the setting of these potentiometers. To replace the joystick with a keypad, we need to evaluate a photo-cells the output and derive one of the potentiometers (Figure 3). By moving the potentiometer in a fixed direction the computer will only register the voltage changes caused by different light levels falling on the photo cell.

Like a customer for the game's creator as that is very hard. If a huge polyhedron of wood, it doesn't get in the way and make the game too difficult to play.

Out there tonight, off near the deserted beach North's legions laid—and there is some

Would have secret thing. Border is long way to each of the pits. #1 #3 #4 #5 on the City plug. Now connect.

Wait #1 to the center leg of the polarity source.

When it is time to log (d) the phone call, there is almost sure to be a third time. The other log is used as the basis for the next call.

When #13 has been collected, the following steps should be followed:

Helpful as it is, the above information is a tip for the small body of other professionals.

That is the wiring completed. House the photo cell in the tube, recessing it about two or three inches. Close the back of the tube to prevent back light from interfering with the photo cell. Before plugging the lighter into the cigarette port, wrap electrical insulation tape around all bare wires making extra sure that there are no short circuits between any of the wires and nested in the Ditty case.

When PLUP the program displays an air column along the bottom of the screen with a green horizontal line as the center line from the border. In columns appear at the top of the screen. If the readings obtained are clustered at one end of the scale adjust the setting of the potentiometer and a satisfactory range is obtained. Table 1 gives a list of values obtained using the technique, and discusses the difficulty of taking some columns apart. To the left, columns can be split and two and five are the only column.

If the lightpen seems to be reading completely the wrong colour from the screen, make sure that you are giving the photo-cell long enough to adjust to the light level before pressing the button. Alternatively, if the lightpen tube is not completely opaque, the shadow from your hand may be affecting the reading. When using the

- 1 Photo card Tandy #275-100a 50p  
1 Musical push button switch Pack of 5 Tandy #275-0147 50p  
1 Tanager control (100K) (potentiometer) Tandy #275-030 75p  
1 5-pin G-14 plug (2 ft) (discrete) to -to- plastic post  
Four long bits of wire and two bits of wire about 4 inches long  
1 speaker tube to house Photo cell  
Total ..... from \$4.00.

[illegible]



Send us your Dragon program, beginning with a general description and then explaining how the program is constructed. Take care that the listings are all bug-free, enclosing a cassette and, if possible, a printout. We pay \$5 for each bug-free program published, double for the program of the month. If you have any problems with the listings, please send your message to the appropriate author. (Source: *News* 7/13/91; the Mountain Stream; 1 editor; 82/12/11/13)

Kevin Lee-Hughes and Julian Chapman in  
discussion

There are many plants, including the *Andropogon*, that could reduce soil moisture and

You have a limited fuel supply and when you run out of fuel you lose control. The program has a limit which is the theme tune of Mass. The program uses PRGDE-4. Graphical Mode to draw concepts to an outline.

[illegible]

800-380-3800  
380-3800  
380-3800  
380-3800

870-890	Sets up fuel
890-740	Plays games on screen. Sets up gas graphics
750-1030	Checks for kinks to be great and. Deletes one fuel point. Checks if you hit anything
1040-1070	Plays crash mode
1080-1710	Tells you if you crashed
2000-2100	Tells you to guess any key to start
2200-2400	Shows you the instructions

[illegible]

**Table 1**







```

1700 FCHAR(1301800):NEXTN
1710 IF "Y":INPUT"WOULD YOU LIKE ANOTHER GO?"(P%:SFF%="Y") THEN RUN ELSE GOTO END
2000 GOTO "PRESS ANY KEY"
2100 IF INKEY="" THEN 2100
2200 RETURN
2300 END

```

## Motor Cross

From Fraser Chisholm in Kilmarnock

**MOTOR CROSS** is a game for one player requiring the simplest of graphics and timing. I have here embodied the driver most often seen on the road without crashing into the walls. This you must do for as long as possible, accumulating the the faster you go the higher your score, but also the more you risk!

When the car leaves the side of the track one point is added to the damage score and when the damage total reaches eight the game is over. The program uses PEEKs to recognise the key being pressed and therefore it is easy to test down the car will keep turning until the key is released.

The track is set up in lines 480-640 and

so can easily be changed or modified to give a different track. The program includes three ROM statements representing the main sections, all of which can be left out to save ROM.

### Program notes

**180-189** Defines 16 positions of car and checks for instructions.  
**190-249** Defines and displays track.  
**250-299** Plays random between and results calculations.  
**300** Gives an appropriate sub routine (see lines 660-680) depending on car's current score depending on current speed and checks to make sure speed plays within current limits.  
**690-699** Checks to see if car has turned full 360-degrees and if so it resets MTO to 16 subroutines to put car

back car position on screen and check for crash.

**Damage routine**  
**Crash routine**  
**Score routine**  
**Play and subroutines**  
**Instructions**

### Variables

**Ang%** M1-M6, and P1-P6, 16 positions of car  
**Time** Car's position of car  
**X,Y** Car's position of car  
**M** Current score  
**SC** Current maximum speed of car  
**DM** Damage of car  
**H** Highest score so far  
**A** Horizontal acceleration of car  
**B** Vertical acceleration of car (used in steering)

```

0 *****
10 ** MATHS CROSS ** 1983 **
20 ***** BY F. J. CHISHOLM *****
30 *****
40 *****
50 FOR C=180 TO 640 STEP 20
60 GOTO PRINTM, MOTOR CROSS C%":PRINTM%," BY F. J. CHISHOLM":PRINTM%," PLEASE WAIT"
70 GOTO 110
80 GOTO 110
90 ***** PROGRAM GRAPHICS *****
100 PRGDE 4:POL5
110 LINE 15,61-69,61:PSET:PSET 15,4,51:PSET 17,4,59:PSET 19,6,51:PSET 17,6,51
120 GET 10,61-69,120,69,61:POL5
130 LINE 15,61-69,61:PSET:PSET 16,4,51:PSET 18,5,59:PSET 16,6,51:PSET 16,6,51
140 GET 10,69-120,120,69,61:POL5
150 LINE 69,61-120,69:PSET:PSET 16,4,51:PSET 18,6,51:PSET 16,6,51:PSET 16,6,51
160 GET 69,61-120,120,69,61:POL5
170 LINE 69,61-120,69:PSET:PSET 16,4,51:PSET 18,6,51:PSET 16,6,51:PSET 16,6,51
180 GET 69,61-120,120,69,61:POL5
190 LINE 69,61-120,69:PSET:PSET 16,4,51:PSET 18,6,51:PSET 16,6,51:PSET 16,6,51
200 GET 69,61-120,120,69,61:POL5
210 LINE 69,61-120,69:PSET:PSET 16,4,51:PSET 18,6,51:PSET 16,6,51:PSET 16,6,51
220 GET 69,61-120,120,69,61:POL5
230 LINE 69,61-120,69:PSET:PSET 16,4,51:PSET 18,6,51:PSET 16,6,51:PSET 16,6,51
240 GET 69,61-120,120,69,61:POL5
250 LINE 69,61-120,69:PSET:PSET 16,4,51:PSET 18,6,51:PSET 16,6,51:PSET 16,6,51
260 GET 69,61-120,120,69,61:POL5
270 LINE 69,61-120,69:PSET:PSET 16,4,51:PSET 18,6,51:PSET 16,6,51:PSET 16,6,51
280 GET 69,61-120,120,69,61:POL5
290 LINE 69,61-120,69:PSET:PSET 16,4,51:PSET 18,6,51:PSET 16,6,51:PSET 16,6,51
300 GET 69,61-120,120,69,61:POL5
310 LINE 69,61-120,69:PSET:PSET 16,4,51:PSET 18,6,51:PSET 16,6,51:PSET 16,6,51
320 GET 69,61-120,120,69,61:POL5
330 LINE 69,61-120,69:PSET:PSET 16,4,51:PSET 18,6,51:PSET 16,6,51:PSET 16,6,51
340 GET 69,61-120,120,69,61:POL5
350 LINE 69,61-120,69:PSET:PSET 16,4,51:PSET 18,6,51:PSET 16,6,51:PSET 16,6,51
360 GET 69,61-120,120,69,61:POL5
370 LINE 69,61-120,69:PSET:PSET 16,4,51:PSET 18,6,51:PSET 16,6,51:PSET 16,6,51

```

Continued  
on page 18





[illegible]









```

240 DATA "C#B1B7B9, 1B41B2B3B4B5B6B7B8B9"
250 DATA "C#B1B7B9B10, 1B41B2B3B4B5B6B7B8B9B10"
260 DATA "C#B1B7B9B11B12, 1B41B2B3B4B5B6B7B8B9B10B11B12"
270 DATA "C#B1B7B9B13B14, 1B41B2B3B4B5B6B7B8B9B10B11B12B13B14"
280 DATA "C#B1B7B9B15B16, 1B41B2B3B4B5B6B7B8B9B10B11B12B13B14B15B16"
290 DATA "C#B1B7B9B17B18, 1B41B2B3B4B5B6B7B8B9B10B11B12B13B14B15B16B17B18"
300 DATA "C#B1B7B9B19B20, 1B41B2B3B4B5B6B7B8B9B10B11B12B13B14B15B16B17B18B19B20"
310 PR=1:GOTO 1:GOTO 2:GOTO 3:GOTO 4:GOTO 5:GOTO 6:GOTO 7:GOTO 8:GOTO 9:GOTO 10:GOTO 11:GOTO 12:GOTO 13:GOTO 14:GOTO 15:GOTO 16:GOTO 17:GOTO 18:GOTO 19:GOTO 20:GOTO 21:GOTO 22:GOTO 23:GOTO 24:GOTO 25:GOTO 26:GOTO 27:GOTO 28:GOTO 29:GOTO 30:GOTO 31:GOTO 32:GOTO 33:GOTO 34:GOTO 35:GOTO 36:GOTO 37:GOTO 38:GOTO 39:GOTO 40:GOTO 41:GOTO 42:GOTO 43:GOTO 44:GOTO 45:GOTO 46:GOTO 47:GOTO 48:GOTO 49:GOTO 50:GOTO 51:GOTO 52:GOTO 53:GOTO 54:GOTO 55:GOTO 56:GOTO 57:GOTO 58:GOTO 59:GOTO 60:GOTO 61:GOTO 62:GOTO 63:GOTO 64:GOTO 65:GOTO 66:GOTO 67:GOTO 68:GOTO 69:GOTO 70:GOTO 71:GOTO 72:GOTO 73:GOTO 74:GOTO 75:GOTO 76:GOTO 77:GOTO 78:GOTO 79:GOTO 80:GOTO 81:GOTO 82:GOTO 83:GOTO 84:GOTO 85:GOTO 86:GOTO 87:GOTO 88:GOTO 89:GOTO 90:GOTO 91:GOTO 92:GOTO 93:GOTO 94:GOTO 95:GOTO 96:GOTO 97:GOTO 98:GOTO 99:GOTO 100:GOTO 101:GOTO 102:GOTO 103:GOTO 104:GOTO 105:GOTO 106:GOTO 107:GOTO 108:GOTO 109:GOTO 110:GOTO 111:GOTO 112:GOTO 113:GOTO 114:GOTO 115:GOTO 116:GOTO 117:GOTO 118:GOTO 119:GOTO 120:GOTO 121:GOTO 122:GOTO 123:GOTO 124:GOTO 125:GOTO 126:GOTO 127:GOTO 128:GOTO 129:GOTO 130:GOTO 131:GOTO 132:GOTO 133:GOTO 134:GOTO 135:GOTO 136:GOTO 137:GOTO 138:GOTO 139:GOTO 140:GOTO 141:GOTO 142:GOTO 143:GOTO 144:GOTO 145:GOTO 146:GOTO 147:GOTO 148:GOTO 149:GOTO 150:GOTO 151:GOTO 152:GOTO 153:GOTO 154:GOTO 155:GOTO 156:GOTO 157:GOTO 158:GOTO 159:GOTO 160:GOTO 161:GOTO 162:GOTO 163:GOTO 164:GOTO 165:GOTO 166:GOTO 167:GOTO 168:GOTO 169:GOTO 170:GOTO 171:GOTO 172:GOTO 173:GOTO 174:GOTO 175:GOTO 176:GOTO 177:GOTO 178:GOTO 179:GOTO 180:GOTO 181:GOTO 182:GOTO 183:GOTO 184:GOTO 185:GOTO 186:GOTO 187:GOTO 188:GOTO 189:GOTO 190:GOTO 191:GOTO 192:GOTO 193:GOTO 194:GOTO 195:GOTO 196:GOTO 197:GOTO 198:GOTO 199:GOTO 200:GOTO 201:GOTO 202:GOTO 203:GOTO 204:GOTO 205:GOTO 206:GOTO 207:GOTO 208:GOTO 209:GOTO 210:GOTO 211:GOTO 212:GOTO 213:GOTO 214:GOTO 215:GOTO 216:GOTO 217:GOTO 218:GOTO 219:GOTO 220:GOTO 221:GOTO 222:GOTO 223:GOTO 224:GOTO 225:GOTO 226:GOTO 227:GOTO 228:GOTO 229:GOTO 230:GOTO 231:GOTO 232:GOTO 233:GOTO 234:GOTO 235:GOTO 236:GOTO 237:GOTO 238:GOTO 239:GOTO 240:GOTO 241:GOTO 242:GOTO 243:GOTO 244:GOTO 245:GOTO 246:GOTO 247:GOTO 248:GOTO 249:GOTO 250:GOTO 251:GOTO 252:GOTO 253:GOTO 254:GOTO 255:GOTO 256:GOTO 257:GOTO 258:GOTO 259:GOTO 260:GOTO 261:GOTO 262:GOTO 263:GOTO 264:GOTO 265:GOTO 266:GOTO 267:GOTO 268:GOTO 269:GOTO 270:GOTO 271:GOTO 272:GOTO 273:GOTO 274:GOTO 275:GOTO 276:GOTO 277:GOTO 278:GOTO 279:GOTO 280:GOTO 281:GOTO 282:GOTO 283:GOTO 284:GOTO 285:GOTO 286:GOTO 287:GOTO 288:GOTO 289:GOTO 290:GOTO 291:GOTO 292:GOTO 293:GOTO 294:GOTO 295:GOTO 296:GOTO 297:GOTO 298:GOTO 299:GOTO 300:GOTO 301:GOTO 302:GOTO 303:GOTO 304:GOTO 305:GOTO 306:GOTO 307:GOTO 308:GOTO 309:GOTO 310:GOTO 311:GOTO 312:GOTO 313:GOTO 314:GOTO 315:GOTO 316:GOTO 317:GOTO 318:GOTO 319:GOTO 320:GOTO 321:GOTO 322:GOTO 323:GOTO 324:GOTO 325:GOTO 326:GOTO 327:GOTO 328:GOTO 329:GOTO 330:GOTO 331:GOTO 332:GOTO 333:GOTO 334:GOTO 335:GOTO 336:GOTO 337:GOTO 338:GOTO 339:GOTO 340:GOTO 341:GOTO 342:GOTO 343:GOTO 344:GOTO 345:GOTO 346:GOTO 347:GOTO 348:GOTO 349:GOTO 350:GOTO 351:GOTO 352:GOTO 353:GOTO 354:GOTO 355:GOTO 356:GOTO 357:GOTO 358:GOTO 359:GOTO 360:GOTO 361:GOTO 362:GOTO 363:GOTO 364:GOTO 365:GOTO 366:GOTO 367:GOTO 368:GOTO 369:GOTO 370:GOTO 371:GOTO 372:GOTO 373:GOTO 374:GOTO 375:GOTO 376:GOTO 377:GOTO 378:GOTO 379:GOTO 380:GOTO 381:GOTO 382:GOTO 383:GOTO 384:GOTO 385:GOTO 386:GOTO 387:GOTO 388:GOTO 389:GOTO 390:GOTO 391:GOTO 392:GOTO 393:GOTO 394:GOTO 395:GOTO 396:GOTO 397:GOTO 398:GOTO 399:GOTO 400:GOTO 401:GOTO 402:GOTO 403:GOTO 404:GOTO 405:GOTO 406:GOTO 407:GOTO 408:GOTO 409:GOTO 410:GOTO 411:GOTO 412:GOTO 413:GOTO 414:GOTO 415:GOTO 416:GOTO 417:GOTO 418:GOTO 419:GOTO 420:GOTO 421:GOTO 422:GOTO 423:GOTO 424:GOTO 425:GOTO 426:GOTO 427:GOTO 428:GOTO 429:GOTO 430:GOTO 431:GOTO 432:GOTO 433:GOTO 434:GOTO 435:GOTO 436:GOTO 437:GOTO 438:GOTO 439:GOTO 440:GOTO 441:GOTO 442:GOTO 443:GOTO 444:GOTO 445:GOTO 446:GOTO 447:GOTO 448:GOTO 449:GOTO 450:GOTO 451:GOTO 452:GOTO 453:GOTO 454:GOTO 455:GOTO 456:GOTO 457:GOTO 458:GOTO 459:GOTO 460:GOTO 461:GOTO 462:GOTO 463:GOTO 464:GOTO 465:GOTO 466:GOTO 467:GOTO 468:GOTO 469:GOTO 470:GOTO 471:GOTO 472:GOTO 473:GOTO 474:GOTO 475:GOTO 476:GOTO 477:GOTO 478:GOTO 479:GOTO 480:GOTO 481:GOTO 482:GOTO 483:GOTO 484:GOTO 485:GOTO 486:GOTO 487:GOTO 488:GOTO 489:GOTO 490:GOTO 491:GOTO 492:GOTO 493:GOTO 494:GOTO 495:GOTO 496:GOTO 497:GOTO 498:GOTO 499:GOTO 500:GOTO 501:GOTO 502:GOTO 503:GOTO 504:GOTO 505:GOTO 506:GOTO 507:GOTO 508:GOTO 509:GOTO 510:GOTO 511:GOTO 512:GOTO 513:GOTO 514:GOTO 515:GOTO 516:GOTO 517:GOTO 518:GOTO 519:GOTO 520:GOTO 521:GOTO 522:GOTO 523:GOTO 524:GOTO 525:GOTO 526:GOTO 527:GOTO 528:GOTO 529:GOTO 530:GOTO 531:GOTO 532:GOTO 533:GOTO 534:GOTO 535:GOTO 536:GOTO 537:GOTO 538:GOTO 539:GOTO 540:GOTO 541:GOTO 542:
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# DRAGON 32 OWNERS

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	Dial Interface Unit (supplied with NETA-1 & 2)	\$2.00
	NETACOR 40 assembly (discette demonstration - integral with NETA-1)	\$50.00
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# DOODLE MASTER

COOLPAD 6470H provides the COOLPAD 3D graphics performance with comprehensive facilities for the definition of graphics objects.

- [illegible]

[illegible]

## TOOLKIT FOR DRAGON 32

**FIGURE 3. A. Schematic of the experimental setup. B. The effect of the initial concentration of the polymer solution on the gelation time. C. The effect of the initial concentration of the polymer solution on the gelation time.**

- **3D** means either off-screen copying or input refreshment (VBL)
- If full-screen then **video** graphics system
- **2D** means **WINDOW-GRAPE** commands and several **fill** options
- **GRAPH** is a **2D** alternative to **fill** (only in your Commodore 64!)
- **Variable** is a **3D** refresh command
- **Sprite** **TRAC** command adds one or two **hit** all-screen only, then **fill** graphics/refresh event
- **WINDOW** and **WPA** commands for screen program modification
- **Custom** characters with **CHARACTER** and **CHAR** (**GRAPH**)
- **Methods** in **GRAPH** or **CHAR** refreshment based on **VR** files



**PREMIER**

**Abstract:** This paper presents a new method for the automatic detection of the onset of a seizure. The method is based on the analysis of the EEG signal. The EEG signal is first filtered to remove the DC component and the power line interference. Then, the signal is divided into segments of 10 seconds each. For each segment, the power spectrum is calculated. The power spectrum is then analyzed to detect the onset of a seizure. The method is evaluated using a set of EEG signals recorded from a patient with epilepsy. The results show that the method is able to detect the onset of a seizure with a sensitivity of 100% and a specificity of 95%.

[illegible]

## Memory address

I WOULD like to know the port memory address for use with a control and light pen on a Dragon 32.

*David Morgan  
Pembroke  
Pembroke*

THE (byte/light) pen outputs are wired to the Dragon's 8-bit counter which is a 16-bit port at location \$F725. However, to read values from this address involves a lot of tedious playing around switching which socket you want to address and finally there is a ROM routine to do it for us.

The values from the five inputs are stored in a number between 0-15 at locations 340 to 344. The values can be updated at any time by using the machine language command at J00 0000 or in Basic using BASIC 10000.

As the entire 8-bit counter is used for output values you cannot also expect to have the count cleared upon when reading the ports.

## Basic converter

I WOULD like to know whether there is a compiler for the Dragon 32 which could convert Basic language straight into machine code.

*G. J. Skellern  
Pembroke  
Dorset*

THERE is such a compiler available for the Dragon 32 called Basic Software. The compiler will take source and graphics as well as FOR NEXT loops, arrays, strings etc. It can also compile programs straight from tape.

The compiler costs £10.00 and is available from Basic Software, 10, Alexandra Parade, Weymouth Dorset DT98 1AA and the telephone number is (01323) 478421.

## Out of the maze

ON THE last screen I have just described the plan view of a maze for string arrays consisting of



ASCII CHR 130 and move a CHR around using the arrow keys.

The problem is how do I detect when the moving CHR is accidentally moved out of the maze?

If the CHR is moved out I also want to print a message when this happens.

*A. Galloway  
Dorchester  
Dorset*

THE easiest way to do this is to PMAX the screen memory. If the characters are moving in and out stored in CHR, and the current position in the screen is x,y, then a simple program line such as  
100 IF PEEK (1024 + (x-32)\*7) > 120 AND PEEK (1024 + (x-120)\*7) < 60 THEN ... out of maze routine will detect whether the player has straggled to leave the maze.

## Defender games

I HAVE owned a Dragon 32 computer for some time now. In my searches of magazines and software dealers, I have so far been unable to find a Defender game for my computer.

Do you know of any such game, and if so, where can I obtain a copy and for how much?

*Stephen G. Moxon  
Cardenham  
Cornwall*

THERE ARE a number of Defender-type games on the market for the Dragon. One of the most exciting I believe I have ever tried Planet Invasion by Microdeal.

This costs £5 and should be available at most such as Beal's

or direct from Microdeal at 41 Years Road, 10 Avenue, Capwell BL20 5AB. The game requires a position to play and has option or break and while options.

## Code accessing

COULD you please tell me if it is possible to access any of the machine code values at Port to be no graphics directly from a machine code program? If so how?

*A. Jordan  
King's Heath  
Birmingham*

LISTED below are the machine code entry addresses for all of the serial graphics commands. Values using a 0 of these you input will set a value 10000 to point to the correct ASCII character, previously held in a table within your own program.

For example, if you wanted to use PRSET, you would set up the 100 to point to 73,00 where a 0 will set the graphics character into what is set, and the 0 set J00 43700.

LINE = 43625  
PORT = 43700  
SCREEN = 43618  
ORCLE = 44034  
PMODE = 44020  
POLS = 43680  
PRSET = 43700  
COLOR = 43632  
BUNT = 44187  
UPPER = 43637

## POKE speeds

IT'S PROBABLY already been answered but why doesn't the weekly published POKE MATCHES and to other POKE

MATCHES work on my Dragon 32 May 1982?

If I try the method of spending up my programs they instantly crash. Presumably something has been changed so is there an alternative location for these files gone? I remain stuck on 0.0 chapters.

*Mike Ashburn  
Ashburn Avenue  
Sheffield*

YOU'RE RIGHT right, the question has already been answered, but it keeps turning up time and time again and so it needs repetition. The command PRSET 441702 (and 441703) loads the RAM chip to address 8000 at double speed (1.1 MHz) hence the basic time factor — also that your machine code doesn't run faster so this is in fact. The 8000 processor at the heart of the Dragon is only capable to run at normal speed. Despite this, however, because the double speed — these Dragons are the exception, not the norm and there is nothing wrong with your Dragon.

Unfortunately, there is nothing you can do about replacing the RAM chip and maybe others with one of a higher specification (which I don't recommend). In any case, Dragon 32s does not recommend the use of the high speed RAM.

## Assembly language

I HAVE bought a copy of Prog compiling the 68000 by Michael Clegg and William Latham to learn assembly language on my Dragon. While assembling for the under £10 do you think would be best to use with my book and how can I purchase it?

*Paul Dargin  
Pulford  
Sheffield*

DRAGON DATA offers a very good assembly compiler for £10.00 called Dragon 32 on L2 8010. This comes on cassette and on video from RAM 1000.

If you prefer a cartridge version this is available, called AS Dragon which also includes a disassembler. This costs £24.00 (not inc. £2.000) and although it is more expensive, it is probably a better investment. Both should be available from most Dragon software dealers including Beal's.





# Competition Corner

Answers to Competition Corner,  
Oregon User, 10113 Little Newport  
Street, London WC2R 2LL

WITH ALL FOOLS DAY nearly on us again it is perhaps appropriate to look at some of the ways in which mathematicians have attempted to fool each other over the years. In each case although the problem may appear very complicated, there is, in fact, a simple method of finding the answer.

1. Bill and Ben start out simultaneously from opposite ends of a straight 10-mile-long road, walking towards each other. Bill walking at three miles an hour. At the same time as the men set off, Bill's dog runs on ahead until he meets Ben. He then turns and runs back to Bill. This procedure is repeated until the dog stops tugging between and forwards between the two men until they finally meet. If the dog runs at ten miles an hour — and no time is lost in changing direction — how far does he run in all?

2. At 12 noon the hands of a clock are set above the other. When will they next be precisely superimposed?

3. The secretary of the Muddlecombe Chess Club was trying to arrange the fixture list for the annual knockout championship. There were 27 entrants, who were to play the winner of each game going forward to the next round, until only one player remains as champion. The secretary wondered there would have to be a number of byes, but how many matches

## Win a printer from DRG

Answer Gordon Lee to win  
DRG Business Systems' prize

in it? would need to be played?

4. I have a three inch cube of wood. By making six cuts with a saw I can cut the block into 27 smaller one inch cubes. However, it is possible to complete the task with a fewer number of cuts. I am allowed to rearrange the pieces before each cut? Now for the answers:

1. I hope that you don't work this out by a series of decreasing distances! Bill and Ben are approaching each other at a combined speed of 3 mph. Therefore they will meet in two hours. As the dog runs at 10 mph it will run a total distance of 20 miles in the time.

2. In the 12 hours from noon to midnight, the hands are one above the other 11 times. As both hands move at constant speeds they coincide every  $\frac{12}{11}$  hours. Thus after noon they will next coincide at

1.09 and 30741 seconds.

3. The easy way to answer this problem is to realise that every game will eliminate one player therefore if there are 27 competitors, all but one of the players will need to be eliminated, and to do this 26 games will need to be played.

4. It is impossible to reduce the number of cuts by rearranging the pieces. Cutting a block in the manner described will produce 27 smaller cubes, of which one will be located in the very centre of the larger cube. This one cube will have all six of its faces newly cut — therefore needing the maximum of six cuts.

This month's competition question is also concerned with cutting cubes of wood. I have a number of large cubes of wood, each of a different size but each with an exact number of edges along the side. I wish to make a quantity of toy blocks for the school library by cutting every large block into one-inch cubes.

Unfortunately the larger blocks have been painted on all surfaces. So I find that after I have completed sawing, I have some blocks with at most one face painted, the rest having all six faces newly cut. In fact there are equal numbers of painted and unpainted cubes. What is the smallest number of small cubes that I could possibly have, and state also the number and sizes of the original large cubes?

## Prize

A PRINTER will not only enhance your programming skills but also add to the range of things you can do with your Dragon — and the month DRG Business Systems gives you the chance to win one of the latest SeikoData models.

The printer in question is the SeikoData GP500A, worth nearly £250. This model prints at 50 characters a second in an 80-column dot matrix format on paper up to 10 inches wide. Features include intermixing of graphic character and double width character modes on a single line, printing a copy as well as the original, and a single command enabling a volume of graphic data to be repeated as many times as you need.

## Rules

TO WIN the SeikoData printer you have to send in the most elegant solution to the puzzle. You must show both the answer to the competition and how to solve it with the use of a Bessie program developed on your Dragon. As a bonus, complete the following sentence in 15 words or less: I want to add a printer to my Dragon because:

Your entry must arrive at Dragon User by the last working day in April. The names of the winner and the solution to the puzzle will be published in our July issue. You may only enter the competition once. Entries will not be acknowledged and we cannot enter into corres-

pondence concerning the result.

## January winner

FIRST OF ALL you had to find all five-digit squares in which the third and fourth digits are alike, all other digits being different. This is to correspond to the word "HAPPY". This can be done easily with a program that creates the squares of those numbers from 100 to 299. By putting the squares into a string the duplication can be tested for. This results in just 12 possible values. Now there are just 12 three-digit squares with all digits different so each possible five-digit square should be matched against the three-digit squares.

Only those pairs that do not contain a common digit are possible because there are no letters common to both "HAPPY" and "NOW". For example the lowest number which could stand for "HAPPY" is 12985, so only those three-digit squares which do not contain a 1, 2, 5 or 8 can be considered. Thus, only the square 284 would be a possibility.

Some of the five-digit squares can be totally eliminated. For instance 24020 is not possible as there is no three-digit square that does not contain at least one of these digits. Some squares such as 40001 have more than one possible pair. This number can be paired with 284, 529, 729 or 784.

All possible pairs should be listed for values of "HAPPY" and "NOW". We now have to find a value for the word

"YEAR" that it is to be prime. But you will notice that the three digits represented by the letters Y, E and A are already determined so they all appear in the other two words. So taking as an example the pair "HAPPY"=12985 and "YEAR"=784 the prime represented by "YEAR" must begin with the digits 192. The first digit can only be a digit which doesn't already appear in the set. A simple program can be devised to test for primes and from this it can be found that only 1927 is prime.

If the procedure is continued down the list all possibilities except for one can be eliminated. However we are told that the professor included the value of this last digit. It is in order that the problem could be solved. If we look at the list of seven possibilities there are five instances where the last digit is a 3, two instances where it is a 7 and only one instance where it is a 9. Therefore only it was this last case that the professor gave us the value for. It would be unique solution be possible. Therefore the solution is: "HAPPY"=12985, "YEAR"=1927, "NOW"=784, "YEAR"=5529.

James MacDonald of Luton was one of the many to find the correct answer. His winning letterhead suggested that Orbs was the right name for a small business computer (we'll let you know if Dragon Date when him up on this). James was recovering the prize donated by Dragon Date itself — a total of 70 software packages.

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